

*Pre-Decisional EA*

**ENVIRONMENTAL ASSESSMENT**

**Reducing Pigeon, Starling, and Sparrow Damage Through an  
Integrated Wildlife Damage Management Program  
in the  
Commonwealth of Virginia**

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In Cooperation With:

VIRGINIA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES (VDACS)

UNITED STATES FISH AND WILDLIFE SERVICE (USFWS)

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### **SUMMARY OF PROPOSED ACTION**

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) proposes to continue the current feral pigeon (*Columbia livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*) damage management program in the Commonwealth of Virginia. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce damage associated with pigeon, starling, and sparrow activities to property, agricultural and natural resources, and public health and safety. Damage management would be conducted on property in Virginia when the resource owner (property owner) or manager requests assistance. Some of the types of damage that resource owners seek to alleviate are: human health threats resulting from the accumulation of fecal droppings which cause slippery surfaces or an increased risk of disease transmission; damage to buildings, sidewalks, rooftops, bridges, ships, and other property from the accumulation of fecal material; feeding on agricultural crops; feeding at grain mills and grain handling areas; the contamination of livestock and human food products; and threats to human safety and to property from bird-aircraft strikes. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, other species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion or harassment would be recommended and utilized to reduce pigeon, starling, or sparrow damage. In other situations, these birds would be removed as humanely as possible using: shooting, trapping, and registered pesticides. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

This Environmental Assessment (EA) replaces the November 5, 1998 EA "Management of pigeon and European starling damage in the Commonwealth of Virginia." The current EA was prepared due to a change in the scope of the program that includes the addition of house sparrow damage management, and the identification of new issues and new information.

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### **ACRONYMS**

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BBS	Breeding Bird Survey
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EEE	Eastern Equine Encephalomyelitis
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
OSHA	Occupational Safety and Health Administration
SLE	St. Louis Encephalomyelitis
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
TGE	Transmissible Gastroenteritis
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Services
VDACS	Virginia Department of Agriculture and Consumer Services
VDGIF	Virginia Department of Game and Inland Fisheries
WEE	Western Equine Encephalomyelitis
WS	Wildlife Services

**NOTE:** On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this Environmental Assessment.

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## Chapter 1 PURPOSE OF AND NEED FOR ACTION

### 1.0 INTRODUCTION

Across the United States, wildlife habitat has been substantially changed as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human/wildlife interactions. In addition, segments of the public desire protection for all wildlife; this protection can create localized conflicts between human and wildlife activities. The *Animal Damage Control Programmatic Final Environmental Impact Statement* (EIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way (United States Department of Agriculture (USDA) 1997):

*"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife is generally regarded as providing economic, recreational and aesthetic benefits . . . and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and value is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well."*

Wildlife damage management is the science of reducing damage or other problems caused by wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 1992). Wildlife Services (WS) (WS was formerly known as Animal Damage Control) uses an Integrated Wildlife Damage Management (IWDM) approach, known as Integrated Pest Management (Animal Damage Control (ADC) Directive 2.105<sup>1</sup>), in which a combination of methods may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 1:1-7 of USDA (1997). These methods may include alteration of cultural practices and habitat and behavioral modification to prevent or reduce damage. The reduction of wildlife damage may also require that local populations be reduced through lethal means.

This environmental assessment (EA) documents the analysis of the potential environmental effects of a proposed Virginia WS feral pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*) damage management program. This analysis relies mainly on existing data contained in published documents (Appendix A), including the *Animal Damage Control Program Final Environmental Impact Statement* (USDA 1997) to which this EA is tiered. USDA (1997) may be obtained by contacting the USDA, Animal and Plant Health Inspection Service (APHIS), WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

WS is the Federal agency directed by law and authorized to protect American resources from damage associated with wildlife (Animal Damage Control Act of March 2, 1931, as amended 46 Stat. 1486; 7 USC. 426-426c and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C). To fulfill this Congressional direction, WS activities are conducted to

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<sup>1</sup> WS Policy Manual - Provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Appendix.

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prevent or reduce wildlife damage caused to agricultural, industrial and natural resources, property, and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, private organizations, and individuals. Therefore, wildlife damage management is not based on punishing offending animals but as one means of reducing damage and is used as part of the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action is derived from the specific threats to resources or the public.

Normally, according to the APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions could be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6,000 - 6,003, (1995)). WS has decided in this case to prepare this EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts from the proposed and planned damage management program. All wildlife damage management that would take place in Virginia would be undertaken according to relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA). Notice of the availability of this document will be published in newspapers, consistent with the agency's NEPA procedures.

WS is a cooperatively funded, service-oriented program that receives requests for assistance from other governmental agencies and entities. Before any wildlife damage management is conducted, Cooperative Agreements, Agreements for Control or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to reduce wildlife damage effectively and efficiently according to applicable federal, state and local laws and Memorandums of Understanding (MOUs) between WS and other agencies. WSs' mission, developed through its strategic planning process, is: 1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* WS's Policy Manual reflects this mission and provides guidance for engaging in wildlife damage management through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1999)

### **1.1 AUTHORITY AND COMPLIANCE**

#### **1.1.1. Wildlife Services Legislative Mandate**

One statutory authority for the WS program is the Animal Damage Control Act of 1931, which provides that:

*"The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of*

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*rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions.”*

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing “bringing (damage) under control”, rather than “eradication” and “suppression” of wildlife populations. In 1988, Congress strengthened the legislative directive and authority of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

*“That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities.”*

### **1.1.2 Virginia Department of Agriculture and Consumer Services Legislative Mandate**

Virginia Department of Agriculture and Consumer Services (VDACS) has the statutory authority to reduce damage to agricultural resources and property, and to protect public health and safety from damage involving birds (Title 3.1 - 1011). VDACS currently has a MOU with WS which establishes a cooperative relationship between WS and VDACS, outlines responsibilities, and sets forth annual objectives and goals of each agency for resolving wildlife conflicts in Virginia.

### **1.1.3 Compliance with Federal and State Statutes**

Several federal laws, state laws, and state regulations regulate WS wildlife damage management. WS complies with these laws and regulations, and consults and cooperates with other agencies as appropriate.

**National Environmental Policy Act.** Environmental documents pursuant to NEPA must be completed before operational activities consistent with the NEPA decision can be implemented. WS also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern.

**Endangered Species Act.** It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the United States Fish and Wildlife Service (USFWS) to use the expertise of the USFWS to ensure that “any action authorized, funded or carried out by such an agency. . . is not likely to jeopardize the continued existence of any endangered or threatened species. . . each agency shall use the best scientific and commercial data available” (Sec. 7(a)(2)).

**Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).** FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into the WS program in Virginia are registered with and regulated by the EPA and VDACS, and used by

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WS in compliance with labeling procedures and requirements.

**Virginia Nuisance Bird Law.** This Act allows the Commissioner of Agriculture for VDACS to conduct surveys and investigations of economic loss or public nuisances caused by birds. The Commissioner may then develop a plan of action when birds cause economic loss or are detrimental to the health and welfare of the public, or create a public nuisance. This Act also allows the Commissioner to provide technical assistance for the suppression of nuisance birds, and to cooperate with federal and state agencies, other public and private agencies, organizations, institutions, and persons.

**Executive Order 13112 of February 3, 1999.** This Order prevents the introduction of invasive species and provides for their control to minimize the economic, ecological, and human health impacts that invasive species cause. Pigeons, starlings, and sparrows are recognized as invasive species that have adverse economic, ecological, and human health impacts.

## **1.2 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS**

**1.2.1 ADC Programmatic Environmental Impact Statement.** WS has issued a Final EIS on the national APHIS/WS program (USDA 1997). Pertinent and current information available in the EIS has been incorporated by reference into this EA.

**1.2.2 USDA-APHIS-WS Environmental Assessment for the Management of Pigeon and European Starling Damage in the Commonwealth of Virginia (1998).** This is the EA by which WS has conducted pigeon and starling damage control activities in Virginia since 1998. The new EA, “Reducing pigeon, starling, and sparrow damage through an integrated wildlife damage management program in the Commonwealth of Virginia” (2000), will replace the 1998 document.

## **1.3 PIGEON, STARLING AND SPARROW BIOLOGY AND BACKGROUND**

### **1.3.1 Pigeons**

Pigeons, or rock doves, are a non-indigenous species that were first introduced into the United States by European settlers as a domestic bird to be used for sport, carrying messages, and as a source of food (USFWS 1981). Many of these birds escaped and eventually formed the feral pigeon populations that are now found throughout the United States, southern Canada, and Mexico (Williams and Corrigan 1994). However, because pigeons are an introduced rather than a native species, they are not protected by federal law or by Virginia state law.

Pigeons are highly dependent on humans to provide them with food and sites for roosting, loafing, and nesting (Williams and Corrigan 1994). Thus, they are commonly found around city buildings, bridges, parks, farm yards, grain elevators, feed mills, and other manmade structures (Williams and Corrigan 1994). Additionally, although pigeons are primarily grain and seed eaters, they will readily feed on garbage, livestock manure, spilled grains, insects, and any other available bits of food (Williams and Corrigan 1994).

### **1.3.2 Starlings.**

European starlings are an introduced species that was intentionally released into North America near New York City in the 1890's (Constantin and Glahn 1989). In just 100 years, the starling's range has extended

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across the continental United States, southern Canada, and northern Mexico and starlings have become one of the most common birds in North America (Feare 1984). The starling population in the United States has been estimated at 140 million birds (Johnson and Glahn 1994).

Starlings utilize a wide variety of habitat types, including cities and towns, farms, ranches, woodlands, lawns, and fields. They also feed upon a variety of foods, including seeds and fruits of wild and cultivated plants, insects and other invertebrates, livestock grains, and garbage (Johnson and Glahn 1994).

Starling damage can affect people in urban areas, industrial locations, airports, and agricultural businesses. Starlings frequently gather during summer, fall, and winter in roosts numbering from several hundred to tens of thousand of birds, and sometimes over 1 million birds per roost (Johnson and Glahn 1994). Roost sites vary and include ornamental trees (e.g., Bartlett pear) in residential subdivisions, pine plantations and red cedar thicket in rural and suburban areas, and structures at industrial, agricultural, and commercial locations. Starlings may occupy the same winter roost sites year after year (Johnson and Glahn 1994).

Starlings, being non-indigenous and because of their negative impacts and competition with native birds, are considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. Any reduction in starling populations in North America, even to the extent of complete eradication, could be considered a beneficial impact to native bird species. Additionally, starlings are not migratory birds protected by federal law ( 50 CFR 10) and are not protected by state law in Virginia.

### **1.3.3 Sparrows**

House sparrows, or English sparrows were introduced to North America from England in 1850 and have spread throughout the continent (Fitzwater 1994). House sparrows are found in nearly every habitat except dense forest, alpine, and desert environments. It prefers human-altered habitats, and is abundant on farms and in cities and suburbs (Robbins et al. 1983). This species is not protected by federal or state laws. Like starlings and pigeons, because of their negative impacts and competition with native bird species, house sparrows are considered by many wildlife biologists, ornithologists, and naturalists to be an undesirable component of North American native ecosystems.

## **1.4 PIGEON, STARLING, AND SPARROW DAMAGE**

### **1.4.1 Damage to property**

Pigeons are associated almost exclusively with man-made structures. They use structures (e.g., bridges, buildings, silos, barns) to roost, loaf, and nest. This results in the defacement and structural degradation of commercial, industrial, residential, and agricultural buildings and equipment. The esthetic value of the property such as cars, statues, buildings, sidewalks, park benches, etc. is diminished because of the odor and unsightliness of accumulated fecal droppings, and there is often an increased cost of maintenance to clean and sanitize buildings, sidewalks, benches, and other property. Large accumulations of fecal droppings may also kill vegetation (Williams and Corrigan 1994).

When starlings concentrate at roost sites, the subsequent fecal droppings can result in damage to vehicles and structures by blistering or discoloring painted surfaces. A considerable nuisance may also be created as a result of the noise created by roosting starlings. There may be increased maintenance costs from

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cleaning and sanitizing buildings, sidewalks, benches, and other structures. Branches of ornamental trees may be broken by large starling roosts.

Sparrows often build nests in and around man-made structures. For example, sparrow nests are commonly found under eaves, behind shutters, in transformers, in drain spouts, and in the gaps between gutters and roofs. Sparrow nests are unsightly, bulky, and highly flammable, and are a potential fire hazard. Additionally, sparrows may plug gutters, causing roofs to leak, or may destroy foam insulation in buildings. The accumulation of fecal droppings in and around buildings and under roost sites create unsanitary and odiferous situations, and the chattering of the flock may be a nuisance to nearby residents (Fitzwater 1994).

### **1.4.2 Public health and safety risks.**

Public health threats can and do result from the accumulation of bird fecal droppings (Lenhart et al. 1997). Pigeons, starlings, and sparrows transmit over 40 diseases to humans and domestic animals including, Salmonellosis, Tuberculosis, Histoplasmosis, Toxoplasmosis, Ornithosis, Cryptococcosis, Encephalitis and Newcastle Disease (Weber 1979, Stickley and Weeks 1985). Of those diseases, Ornithosis and Histoplasmosis are the two which cause the most concern as being public health hazards. Pigeons can also be carriers of the *E. coli* bacteria and were recently found to have contaminated the town water supply in Belchertown, Massachusetts (Hill 1999). Pigeon droppings containing *E. coli* accumulated beneath a town water tower and were washed into the water system during a rainstorm.

Histoplasmosis, a fungal respiratory disease that is a serious human health concern, results from the fungus *Histoplasma capsulatum* which may grow in the soil beneath pigeon or starling roosts (Lenhart et al. 1997). Most cases of histoplasmosis go unnoticed, but this disease can cause blindness and/or death (Johnson and Glahn 1994, Lenhart et al. 1997). Fecal droppings at roost sites enrich the soil and encourage the growth of *H. capsulatum*. Histoplasmosis is contracted by inhalation of air-borne spores in the dust of disturbed soil, and anyone exposed through activities where material contaminated with *H. capsulatum* becomes airborne can develop histoplasmosis if enough spores are inhaled (Anonymous 1998, Lenhart et al. 1997). Histoplasmosis is detectable in the soil after bird roosts have been established for 3 years (Lenhart et al. 1997, Weber 1979). Additionally, pigeons have been associated with histoplasmosis in many cases involving old buildings (Weber 1979). This disease is not contracted by direct contact with birds or their droppings (Lenhart et al. 1997).

Ornithosis, also called psittacosis or chlamydiosis, is an infectious respiratory disease caused by *Chlamydia psittaci*, a virus-like organism that affects humans, pets, and livestock (McLean 1994). Pigeons are often chronically infected with chlamydia organisms and are most commonly associated with the transmission of Ornithosis to humans (McLean 1994, Weber 1979), although this disease has also been associated with starlings and sparrows (Weber 1979). Birds have adapted to the disease and show no symptoms, but act as carriers, shedding the organisms in their feces, which later may become airborne as dust (McLean 1994). Infection of chlamydia occurs through the inhalation of particles from dried feces, feathers, nasal discharge, and conjunctival secretions (Weber 1979). Ornithosis, is under-reported because diagnosis of the disease is difficult (Lenhart et al. 1997). Contamination of animal and human foods and unsafe/unsanitary working conditions can also occur from chlamydia (Weber 1979).

Cryptococcal infection occurs from inhalation of the fungus along with the dust from areas enriched with fecal droppings (Lenhart et al. 1997). Cryptococcal spores gain a competitive advantage over other microorganisms and multiplies well in dry bird manure accumulated in places not exposed to direct sunlight (Lenhart et al. 1997). Cryptococcosis has occurred in workmen demolishing old buildings which

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pigeons historically roosted in (Weber 1979). Cryptococcosis may result in chronic, usually fatal, meningitis (McLean 1994).

Toxoplasmosis is a parasitic infection caused by the protozoa *Toxoplasma gondii*. Pigeons frequently transmit toxoplasmosis through fecal contamination, respiratory droplets, eye secretions, contact with infected tissues, or through ectoparasites (Weber 1979). Starlings and sparrows are also associated with the disease. In one survey, 75% of sparrows examined were reported to have the parasite in several organs and tissues (Weber 1979).

Pigeons, starlings, and sparrows are also amplifying hosts for various encephalitis viruses (Fitzwater 1994, Weber 1979). Encephalitis is a general term for inflammation of the brain, and may result from a series of viral diseases that cause damage to the central nervous system (Weber 1979). The three primary bird-related encephalitis viruses are Eastern equine encephalomyelitis (EEE), Western equine encephalomyelitis (WEE), and St. Louis encephalitis (SLE) (Weber 1979).

When pigeon or starling roosts are located in or on industrial or commercial structures or ships conditions may become unsanitary and hazardous for workers and visitors. Contamination and damage to equipment in the vicinity of roosts and feeding areas can occur due to the accumulation of fecal droppings. Walkways, catwalks, and stairways become slippery and people have fallen or slipped when walking on walkways and stairways covered with bird feces. Additional costs associated with pigeon or starling roost damage include low morale of employees routinely working in bird droppings, strife between management and employee unions because of filthy work conditions caused by accumulations of bird droppings, anxiety of residents wanting assistance from local health departments and local government to reduce bird damage and resolve lingering health concerns, loss of customers to businesses irritated by walking in or breathing fumes of fecal droppings, labor and disinfectants to clean and sanitize walkways, benches, and property, and loss of time contacting government agencies for assistance.

The control of nuisance birds in the workplace is mandated by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). OSHA sanitation standard 29CFR 1910.141 (a)(5) Vermin Control states that "Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practicable, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected." An OSHA National News Release on October 20, 1999 reported that a Hoboken, N.J. manufacturer was fined \$530,500 for failure to carry out promises to correct numerous workplace hazards. The health and safety violations included failure to control vermin in the workplace, and the company was fined \$48,000 for severe accumulations of pigeon fecal droppings.

### **1.4.3 Threats to Aviation.**

Pigeons can pose a serious threat to human safety because of the potential for bird/aircraft strikes (Weber 1979, Williams and Corrigan 1994). The US Air Force considers pigeons a medium priority hazard to jet aircraft (Williams and Corrigan 1994).

Starlings and blackbirds represent 13% of all birds involved in bird-aircraft strikes (Cleary et al. 1997). Starlings, when in large flocks or flight lines entering or exiting a winter roost at or near airports, present a safety threat to aviation. Starlings are a particularly dangerous bird to aircraft during take-offs and landings because of their high body density and tendency to travel in large flocks of hundreds to thousands of birds (Seamans et al. 1995). On March 10, 1960 a Lockheed Electra turbo-prop aircraft in Boston ingested starlings into all engines upon takeoff and crashed, resulting in the death of 62 people (Johnson

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and Glahn 1994, Weber 1979). A Lear jet crashed near Atlanta, Georgia, in 1973, killing 7 people after striking a flock of starlings during take-off.

Generally, bird collisions occur when aircraft are near the ground. More than 45% of bird/aircraft collisions occur within 100 feet of the ground and more than 75% occur within 1,500 feet of the ground (USDA 1997). Blackbirds and doves were among the most commonly struck bird groups in reported strikes. Pigeons, starlings, and sparrows (all species of sparrows and similar birds) represented 4%, 5%, and 8%, respectively, of identified birds involved in bird/aircraft strikes (Cleary et al. 1997).

Pigeons, starlings, and sparrows cause economic and safety damage to aircraft in hangars. Accumulation of fecal droppings on planes, helicopters, maintenance equipment, and hangar floors result in unscheduled maintenance to clean planes and buildings to protect painted surfaces from acidic fecal droppings and maintain a sanitary work environment. Also, these birds build nests in engines of idle aircraft which can catch fire or cause engine damage. Additional costs from pigeon, starling, and sparrow damage to aviation include implementation of damage management techniques, labor and labor costs to check aircraft engines for nests, labor and effort to clean and sanitize stored aircraft, and time spent working with local health departments and state and federal wildlife agencies for assistance.

### **1.4.4 Damage to Agriculture**

Pigeons, starlings, and sparrows in grain handling areas or facilities may consume and contaminate large quantities of food intended for human or livestock consumption (Fitzwater 1994, Johnson and Glahn 1994, Williams and Corrigan 1994). These birds may transmit diseases to livestock through their droppings and harbor numerous parasites. For example, pigeons may transmit the northern fowl mite, an important poultry pest (Williams and Corrigan 1994) and starlings may spread the transmissible gastroenteritis (TGE) virus, a disease of concern to swine producers (Johnson and Glahn 1994).

In agricultural settings, pigeon, starling, and sparrow use of agricultural buildings as roost sites contaminates livestock feed and bedding, agricultural equipment, and livestock. In winter, livestock feedlots and dairies are commonly selected as feeding and roost sites by starlings, especially during inclement winter weather (Glahn and Otis 1986). This adversely affects livestock/dairy operations by removal of food for livestock (White et al. 1985) and contaminating livestock food, resulting in increased production costs and possible health threats to livestock (Gough and Beyer 1982). Transmissible gastroenteritis virus (TGE), a disease of particular concern to swine producers, has been shown to be transmitted through starling feces (Johnson and Glahn 1994, Weber 1979). The virus can pass through the starlings' digestive tract and be infectious in the feces (Johnson and Glahn 1994). In this way, starlings can be responsible for transferring TGE from one livestock facility to another (Johnson and Glahn 1994). Starlings may be involved in the spread of other livestock diseases, although their role in the transmission of these diseases is not fully understood (Johnson and Glahn 1994). Additional costs associated with pigeons, starlings, and sparrows in livestock operations is operating costs to replace consumed feed and veterinary care for animals infected or suspected of infection with disease by starlings.

Starlings and sparrows can also have a severe detrimental impact on agricultural food production by feeding at vineyards, orchards, gardens, cropfields, and feedlots (Weber 1979). For example, starlings feed on numerous types of fruits such as, cherries, figs, blueberries, apples, apricots, grapes, nectarines, peaches, plums, persimmons, strawberries, and olives (Weber 1979). Starlings were also recently found to damage ripening corn (Johnson and Glahn 1994) and are known to feed on the green, milk and dough stage kernels of sorghum (Weber 1979). Additionally, starlings may pull sprouting grains, especially

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winter wheat, and feed on planted seed (Johnson and Glahn 1994). Sparrows damage crops by pecking seeds, seedlings, buds, flowers, vegetables, and maturing fruits (Fitzwater 1994), and localized damage can be great because sparrows often feed in large flocks on a small area (Fitzwater 1994).

### **1.4.5 Damage to natural resources.**

Large winter starling roosts can create an extremely high ammonia content in the soil, thus polluting the ground water and killing certain kinds of woody plants (Weber 1979). Tree limbs may also be broken in large roosts and the area may reek of ammonia when it rains (Weber 1979). Excessive accumulation of fecal droppings over years can kill trees.

Starlings commonly compete with native cavity-nesting species such as bluebirds, flickers, other woodpeckers, purple martins, and wood ducks for nest sites (Johnson and Glahn 1994). Starlings also commonly kill native birds such as flickers and bluebirds by stabbing them to death with its sharp beak, and then taking over the nest (Weber 1979). The eggs of native birds may also be destroyed (Weber 1979).

Sparrows are an aggressive and persistent species and commonly drive desirable native bird species from nesting and feeding sites (Weber 1979). Sparrows frequently displace martins and bluebirds, in particular, and destroy their eggs and young (Fitzwater 1994).

## **1.5 SCOPE AND PURPOSE OF THIS EA**

The scope and purpose of this EA is to address and evaluate the potential impact to the human environment from WS pigeon, starling, and sparrow damage management to protect agricultural and natural resources, property, and public health and safety in Virginia. Damage problems can occur throughout the State, resulting in requests for WS assistance. Under the Proposed Action, nuisance damage management could be conducted on private, federal, state, tribal, county, and municipal lands in Virginia upon request. Virginia encompasses about 26,090,880 acres; during Fiscal Year (FY) 98, WS had 19, 19, and 4 *Agreements for Control* to conduct pigeon, starling, and sparrow damage management, respectively, on a total of 6,500 acres or less than 0.025 % of the land area of Virginia (Management Information System (MIS) 1998). In FY 99, Virginia WS conducted 22, 20, and 5 damage management projects for pigeon, starling, and sparrow damage management (respectively) on properties covering an area of about 6,780 acres or about 0.026% of the land area of Virginia (MIS 1999).

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### **1.6 NEED FOR PIGEON, STARLING, AND SPARROW DAMAGE MANAGEMENT IN VIRGINIA**

Conflicts between humans and wildlife are common in Virginia. The Virginia WS Program received 3,351 requests for wildlife damage management assistance from the public between federal FY95 and 99. During this period, pigeon, starling, and sparrow damage management requests ranked as the 5<sup>th</sup>, 7<sup>th</sup>, and 34<sup>th</sup> most common types of request for wildlife damage management assistance, respectively. WS received 160 requests for pigeon damage assistance, 111 requests for starling damage assistance, and 14 requests for sparrow damage assistance from the public during this period.

The need for action in Virginia is based on the necessity for a program to protect agricultural and natural resources, property, and human health and safety from pigeon, starling, and sparrow damage. Pigeon, starling, and sparrow populations can have a negative economic impact in Virginia. Comprehensive surveys of pigeon, starling, and sparrow damage in Virginia have not been conducted. However, Virginia WS compiled estimates of the types of damage perceived by property and resource owners or managers who requested WS assistance, and public health and safety risks. Damage data obtained for FY97 through FY99 are summarized (Tables 1-1). These data represent only a portion of the total damage caused by pigeons, starlings, and sparrows because not all people who experience damage request assistance from WS.

### **1.7 PROPOSED ACTION**

The proposed action is to continue to implement the current Virginia WS integrated pigeon, starling, and sparrow damage management program for the protection of agricultural and natural resources, property, and public health and safety on all lands in Virginia where a need exists and a request is received. Managers and property owners

**Table 1-1. Number of Damage Reports received by Wildlife Services for Pigeons, Starlings, and Sparrows (MIS 1997, 1998, 1999).**

F Y	Species	Agriculture <sup>1</sup>	Natural Resources	Property	Public Health/Safety
97	Pigeons			20	7
	Starlings	1		11	9
	Sparrows			1	1
98	Pigeons			15	6
	Starlings	1		20	9
	Sparrows			4	1
99	Pigeons			40	13
	Starlings	2		15	6
	Sparrows			1	2

would continue to be provided technical assistance regarding the use of non-lethal methods. Technical assistance includes: instructional sessions, information about exclusion devices, harassment, and lethal damage management methods. An IWDM approach would be used by WS, which would consider all legal and appropriate methods either used singly or in

combination to meet the requester's needs for reducing damage. Non-lethal methods include, but would not be

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limited to, environmental/habitat modification, harassment, cultural practices, animal behavior modification, and repellents. Lethal methods used by WS may potentially include shooting, pesticide application, and trapping. Pigeon, starling, and sparrow damage management would be allowed in the State, when requested, on private or public property after an *Agreement for Control* or other comparable document has been completed. All pigeon, starling, and sparrow damage management would be consistent with other uses of the area and would comply with appropriate federal, state and local laws and in cooperation with other governmental agencies and tribal governments. (See Chapter 3 for a more detailed description of the current program and the proposed action).

### **1.8 DECISION TO BE MADE**

Based on the scope of this EA, the decisions to be made are:

- Should WS continue the currently implemented IWDM strategy, including nonlethal and lethal methods, to meet the need for pigeon, starling, and sparrow damage management?
- If not, should WS attempt to implement one of the alternatives to an IWDM strategy as described in the EA?
- Would the proposed action have significant impacts on the quality of the human environment, requiring preparation of an EIS?

### **1.9 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS**

**1.9.1 Actions Analyzed.** This EA evaluates pigeon, starling, and sparrow damage management by WS to protect: 1) property, 2) agricultural and natural resources, and 3) public health and safety in Virginia. Protection of other resources or other program activities would be addressed in other NEPA analysis, as appropriate.

**1.9.2 Wildlife Species Potentially Protected by Virginia WS.** Virginia WS assistance may be requested to achieve management objectives for wildlife, including Threatened and Endangered (T&E) species. If other needs are identified, a determination would be made on a case-by-case basis if additional NEPA analysis is needed.

**1.9.3 American Indian Lands and Tribes.** Currently, Virginia WS does not have any MOUs with any American Indian tribe. If WS enters into an agreement with a tribe for pigeon, starling, or sparrow damage management, this EA would be reviewed and supplemented if appropriate to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting pigeon, starling, or sparrow damage management on tribal lands.

**1.9.4 Period for which this EA is Valid.** This EA would remain valid until Virginia WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA is sufficient.

**1.9.5 Site Specificity.** This EA analyzes the potential impacts of pigeon, starling, and sparrow damage management and addresses activities on all lands in Virginia under MOU, Cooperative Agreement and in

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cooperation with the appropriate public land management agencies. It also addresses the impacts of pigeon, starling, and sparrow damage management on areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional wildlife damage management efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever pigeon, starling, and sparrow damage and resulting management occurs, and are treated as such. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in Virginia (see Chapter 3 for a description of the Decision Model and its application).

**1.9.6 Summary of Public Involvement.** Issues related to the proposed action were initially developed by WS. Issues were defined and preliminary alternatives were identified. In 1996, WS sent letters soliciting public input on the proposed action to 76 state and federal agencies, organizations, businesses, and individuals. At this time, the proposed action was to conduct an IWDM program to alleviate damage from pigeons and starlings in Virginia. Notices soliciting public comment were posted in two regional newspapers in June and July 1996, providing for a 30-day public comment period. No comments were received from the public.

### **1.10 PREVIEW OF THE REMAINDER OF THIS EA**

The remainder of this EA is composed of four (4) chapters and three (3) appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, mitigation and standard operating procedures (SOP). Chapter 4 analyzes environmental consequences and the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers of this EA. Appendix A is the literature cited used during the preparation of the EA, Appendix B is a detailed description of the methods used for pigeon, starling, and sparrow damage management in Virginia, and Appendix C includes population trends from Breeding Bird Survey (BBS).

## **CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT**

### **2.0 INTRODUCTION**

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Chapter 2 contains a discussion of the issues, including issues that received detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues used to develop mitigation measures and SOPs, and issues not considered in detail, with the rationale. Pertinent portions of the affected environment are included in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments are incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the current program in Chapter 3.

### **2.1 AFFECTED ENVIRONMENT**

The areas of the proposed action include areas in and around buildings and parks, bridges, industrial sites, urban/suburban woodlots, and on ship fleets, where pigeons, starlings, and sparrows may roost, loaf, or nest. Damage management activities may also be conducted at agricultural fields, vineyards, orchards, farmyards, grain mills, and grain handling areas (e.g. railroad yards) where pigeons, starlings, or sparrows destroy crops, feed on spilled grains, or contaminate food products for human or livestock consumption. Additionally, the area of the proposed action would include airports and surrounding property where pigeons, starlings, and sparrows represent a threat to aviation safety.

### **2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4**

Issues have been identified from comments received from the public and state and federal government agencies. The issues are summarized below:

- Effects on other wildlife species, including T&E species
- Effects on public health and safety
- Impacts to stakeholders, including aesthetics

#### **2.2.1 Effects on other wildlife species, including T&E species.**

A common concern among members of the public and wildlife professionals, including WS personnel, is whether the proposed action or any of the alternatives might result in adverse impacts to populations of other wildlife, particularly T&E species. WS's mitigation measures and SOPs are designed to reduce the effects on non-target species' populations and are presented in Chapter 3. To reduce the risks of adverse affects to non-target species, WS would select damage management methods that are target-selective or apply such methods in ways to reduce the likelihood of capturing or killing non-target species. Terwilliger (1991), Terwilliger and Tate (1995), and the USFWS list of T&E species in Virginia (<http://www.fws.gov/r9endspp/endspp.html>) were reviewed to identify federal and state T&E species in Virginia.

The USFWS Biological Opinion (U.S. Department of Interior (USDI) 1992) identified no T&E species in Virginia that would be adversely affected by chemical or nonchemical pigeon, starling, or sparrow damage control methods. Formal risk assessment (USDA 1997, Appendix P) has also shown that there are no probable risks to T&E species in Virginia from pigeon, starling, or sparrow damage control methods.

Some members of the public are concerned that the use of registered toxicants to reduce pigeon, starling, or sparrow damage would have adverse impacts on other wildlife species, including T&E species. WS would use Compound DRC-1339 to reduce pigeon and starling populations and Avitrol (4-Aminopyridine) to reduce pigeon, starling, and sparrow damage by frightening.

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Compound DRC-1339 is an EPA registered, selective chemical which has proven to be effective in reducing starling and pigeon damage in a variety of situations (DeCino et al. 1966) and in reducing roosting populations of pigeons (Blanton et al. 1992). Use of DRC-1339 is restricted to USDA-APHIS personnel (Timm 1994). DRC-1339 is metabolized or excreted within hours after ingestion, while the bird is still alive. The metabolites are nontoxic to most birds and mammals, and thus, there is little secondary toxicity hazard to scavengers eating dead birds (Blanton et al. 1992, Schafer 1981, Timm 1994, USDA 1997). Mammals are generally not sensitive to the toxic effects of DRC-1339 (Timm 1994), and the compound is less toxic to most other birds (Cunningham et al. 1979, Knittle et al. 1980). Cunningham et al. (1979) estimated that a sensitive species such as owls or magpies, would be at risk only if their diet consisted entirely of DRC-1339 treated pigeons or starlings for more than 30 consecutive days.

Avitrol (4-Aminopyridine) is a bird damage management chemical registered for use as a flock-frightening repellent (Timm 1994). Birds that ingest the material become disoriented, emit distress calls, and exhibit erratic flight, tremors, and convulsions before death (Timm 1994). A lethal dose of Avitrol is necessary to produce the distress behavior in most species. Avitrol treated bait is generally mixed with untreated bait so that only a few birds ingest a treated particle and produce the distress behavior, which often frightens the other birds in the flock and causes them to leave the area (Timm 1994). Avitrol has been shown to be non-cumulative, is rapidly metabolized by birds, and thus has minimal secondary hazards when used according to the recommended application rates (Schafer 1991, Timm 1994). Holler and Schafer (1982) report that although the subacute and chronic toxicity data are not substantial, they indicate that secondary poisoning of a variety of avian and mammalian predators or scavengers should not occur. There may be some limited hazards to some predatory species (i.e. American kestrels (*Falco sparverius*)) consuming unabsorbed chemical in the gastrointestinal tract of affected or dead birds when the dilution rate is 1:9 or less (Holler and Schaefer 1982). However, American kestrels did not appear to be affected when fed blackbirds killed with Avitrol with dosages above the reported LD<sub>50</sub> (Schafer et al. 1974). Other raptors (i.e., sharp-shinned hawks (*Accipiter striatus*)) appear unaffected by Avitrol, even when low dilution rates are used (Holler and Schafer 1982). American kestrels, sharp-shinned hawks, and red-tailed hawks (*Buteo jamaicensis*) and canines (*Canis spp.*) and rats (*Rattus norvegicus*) were unaffected when force fed dead blackbirds killed by a high dilution (i.e., 1:99) of Avitrol (Schafer et al. 1974). To eliminate this potential for secondary toxicity, WS personnel would retrieve all dead birds to the extent possible, following treatment with Avitrol.

Avitrol is acutely toxic to mammalian species, with LD<sub>50</sub> values generally less than 10 mg/kg (USDA 1997). Delmarva fox squirrels (*Sciurus niger cinereus*) are a federally listed endangered species living on Assateague Island and may be affected if treated grain bait were consumed. Therefore, Avitrol will not be applied on Assateague Island without further consultation with the USFWS.

Peregrine falcons (*Falco peregrinus*) and bald eagles (*Haliaeetus leucocephalus*) are both known to occur in Virginia in areas where WS could be requested to conduct pigeon, starling, or sparrow damage management activities. These are species of concern, although peregrine falcons have been delisted from the ESA (Federal Register 1999a) and the removal of bald eagles from the list of federally threatened species has also been proposed (Federal Register 1999b). Risk assessment analysis concluded that DRC-1339 would have no effect on peregrine falcons or bald eagles (USDA 1997, Appendix P). Informal Section 7 Consultation with the USFWS and the Virginia Department of Game and Inland Fisheries (VDGIF) concluded the use of DRC-1339 or sealing building used by pigeons would have no affect on peregrine falcons (P. Nickerson, USFWS, pers. commun., C. Schulz, USFWS, pers. commun., K. Terwilliger, VDGIF, pers. commun., K. Cline, VDGIF, pers. commun.). Additionally, the USFWS Biological Opinion (U.S. Department of Interior (USDI) 1992) identified no chemicals used by WS that would adversely impact peregrine falcons or bald eagles. Although DRC-1339 offers minimal or no risk

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of secondary poisoning to predatory or scavenger species, WS personnel would retrieve and remove all dead pigeons or starlings to the extent possible in areas where peregrine falcons are present. These birds would be disposed of according to the EPA label instructions. Because Avitrol poses a slight secondary poisoning risk to peregrine falcons and bald eagles scavenging dead pigeons, this chemical would not be used by WS when these birds are present (C. Schulz, USFWS, pers. commun.).

### **2.2.2 Effects on public health and safety.**

A common concern is whether the proposed action or any of the alternatives pose an increased threat to public health and safety. In particular, there is concern that the lethal methods of pigeon, starling, and sparrow removal (i.e., pesticide application and shooting) may be hazardous to people and pets, or that continued increases in pigeon and starling populations might threaten public health or safety.

Firearm use is very sensitive and a public concern because of safety relating to the public, and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

The use of Avitrol and DRC-1339 for pigeon, starling, and sparrow damage management poses no risk to public health and safety. WS personnel who apply pesticides are certified restricted use pesticide applicators and apply pesticides according to label instructions. Certification is obtained after passing written tests administered by the VDACS, Office of Pesticide Management.

### **2.2.3 Impacts to stakeholders, including aesthetics.**

The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public is no exception and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as “pets” or exhibit affection toward these animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to reduce conflicts/problems between humans and wildlife.

There is some concern that the proposed action or the alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (e.g., reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (e.g., ecological, existence, bequest values) (Bishop 1987). Direct benefits

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are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using up the animal or intending to) or non-consumptive use (viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefitting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is merely knowledge that the animals exist (Decker and Goff 1987).

IWDM reduces damage or threats to public health or safety to people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. Many people directly affected by problems and threats to public health or safety caused by pigeons, starlings, or sparrows insist upon their removal from the property or public location when they cause damage. Some people have an idealistic view and believe that all wildlife should be captured and relocated to another area to alleviate damage or threats to public health or safety. Some people directly affected by the problems caused by wildlife strongly support removal. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations or sites. Some people totally opposed to pigeon, starling, or sparrow damage management want WS to teach tolerance for damage and threats to public health or safety, and that wildlife should never be killed. Some people would strongly oppose removal of the pigeons, starlings, and sparrows regardless of the amount of damage. Some of the people who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

Virginia WS only conducts wildlife damage management at the request of the affected home/property owner or resource manager. If WS received requests from an individual or official for pigeon, starling, or sparrow, damage management, WS would address the issues/concerns and consideration would be made to explain the reasons why the individual damage management actions would be necessary. Management actions would be carried out in a caring, humane, and professional manner.

## **2.3 ADDITIONAL ISSUES USED TO DEVELOP MITIGATION MEASURES**

### **2.3.1 Cultural Resources Concerns**

The National Historic Preservation Act of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and to consult with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of federal undertakings. The Native American Graves and Repatriation Act of 1990 provides for protection of American Indian burial sites, human remains, funerary objects and sacred objects, and establishes procedures for notifying tribes of any new discoveries.

In most cases, pigeon, starling, and sparrow damage management has little potential to cause adverse effects to sensitive cultural resources. The areas where damage management would be conducted are small and pose no ground disturbance. The Virginia Department of Historic Resources (VDHR) has reviewed the program as proposed and concluded that the pigeon, starling, and sparrow damage management program, "*does not have the potential to cause effects on historic properties*" (C. Metz, Virginia Department of Historic Resources, letter to M. Lowney, WS, May 19, 2000).

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### **2.3.4 Environmental Justice and Executive Order 12898 - “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”**

Environmental Justice (EJ) has been defined as the pursuit of equal justice protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Fair treatment implies that no person or group should endure a disproportionate share of the negative environmental impacts resulting from this country's domestic and foreign policies or programs.

Executive Order 12898 requires federal agencies to make EJ part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies and activities on minority and low-income persons or populations. APHIS plans to implement Executive Order 12898 principally through the provisions of NEPA.

WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by APHIS-WS are regulated by the EPA through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the VDACS, by MOUs with land managing agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used according to label directions, they are selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1997, Appendix P). The WS operational program properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations. In contrast, the proposed action may benefit minority or low-income populations by reducing bird damage such as threats to public health and safety.

### **2.3.5 Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).**

Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed pigeon, starling, and sparrow damage management would only occur by using legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

### **2.3.6 Public's Concern About the Use of Chemicals.**

Much of the public concern over the use of registered toxicants for wildlife damage management is based on an erroneous perception that WS uses non-selective, outdated chemical methodologies. However, chemical methods used and proposed for use by WS have a high degree of selectivity. Currently, the use of registered toxicants by WS in all instances is regulated by the EPA through the FIFRA, by MOUs with other agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemicals are used according to label directions, they are selective for target individuals or populations, and such use has negligible impacts on the environment (USDA 1997). A decision to ban toxicants is outside of WS's authority. WS could elect not to use registered toxicants, but those registered for use in Virginia are an integral part of IWDM and their selection for use would follow criteria in the Decision Model (Slate et al. 1992).

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### **2.4 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE**

#### **2.4.1 Effects on pigeon, starling, and sparrow populations.**

Pigeons, starlings, and sparrows are non-indigenous species considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. Any reduction in pigeon, starling, or sparrow populations in North America, even to the extent of complete eradication, could be considered a beneficial impact to native bird species. Pigeons, starlings, and sparrows are considered invasive nuisance birds and are not protected by Virginia state law or by federal law.

In addition, WS damage management activities are site specific, and although local populations of pigeons, starlings, or sparrows could be reduced or dispersed, there would be no adverse impacts from Virginia WS actions.

#### **2.4.2 Humaneness of methods to be used.**

The issue of humaneness, as it relates to the killing or capturing of wildlife, is an important but very complex concept that can be interpreted in a variety of ways.

Humaneness is a person's perception of the impact of an action, and individuals may perceive the humaneness of an action differently. Many groups, including animal welfare and animal rights organizations, are concerned that some methods used by WS to

reduce wildlife damage are inhumane. In this situation, the issue is whether the methods used in a wildlife damage management activity expose the targeted animal to unnecessary pain and suffering. Most animal welfare organizations do not oppose the concept of wildlife damage management, but support more restrictions on methods perceived as inhumane and greater use of nonlethal methods. Animal rights advocates oppose killing or harming animals for human gain because they believe animals have rights equal to or similar to humans (Schmidt 1989, Wywiałowski 1991).

WS personnel are experienced and professional in their use of management methods, and methods are applied as humanely as possible. For situations in which it is practical to capture and euthanize wild animals, WS follows euthanasia methods recommended by the American Veterinary Medical Association (AVMA) or the recommendations of a veterinarian, even though the AVMA euthanasia methods were developed principally for companion animals and slaughter of food animals, and not for free-ranging wildlife (AVMA 1993).

#### **2.4.2 No wildlife damage management at taxpayer expense; wildlife damage management should be fee based.**

Funding for WS comes from a variety of sources in addition to federal appropriations. Virginia agency funds, county funds, city funds, private funds, and other federal agency funds are applied to the program under Cooperative Agreements. Federal, State, and local officials have decided that wildlife damage

**Table 2-1. Number of Pigeons, Starlings, and Sparrows removed by WS in Virginia (MIS FY97, FY98, FY99,).**

Number taken by WS	1997	1998	1999
Pigeons	364	5173	1782
Starlings	48	12	1422
Sparrows	2	1	7

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management should be conducted by appropriating funds. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Wildlife damage management is an appropriate sphere of activity for government programs, since aspects of wildlife damage management are a government responsibility and authorized and directed by law.

### **2.4.3 Pigeon, starling, and sparrow damage should be managed by private nuisance wildlife control agents**

In Virginia, pigeons, starlings, and sparrows can be removed by anyone at any time without a federal or state permit. Therefore, private nuisance wildlife control agents could be contacted to reduce pigeon, starling, or sparrow damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses and cities and towns may prefer to use WS because of security and safety issues and reduced administrative burden. Additionally, use of the pesticide DRC-1339 may be the most effective damage management method in some situations, either used alone or as part of an IWDG program. This avicide is registered only for use by WS and is not available to private nuisance wildlife control agents or property owners.

### **2.4.4 Relocation of wildlife should be used**

Relocation of problem wildlife species is a technique that is sometimes used to alleviate wildlife damage problems. The success of a relocation effort, however, depends on the potential for the problem individuals to be captured efficiently and the existence of an appropriate relocation site (Nielsen 1988). However, relocation of wildlife must be approved by the VDGIF for it to be legal, and the VDGIF will not allow the relocation of pigeons, starlings, or sparrows in Virginia to alleviate wildlife conflicts because relocated animals frequently become problems at the release site.

Relocation of damaging birds to other areas following live capture generally would not be efficacious nor cost-effective. Since starlings, pigeons, sparrows, and most other damaging species are common and numerous throughout Virginia, they are rarely if ever relocated because habitats in other areas are generally already occupied. Relocation of wildlife often involves stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats.

Pigeons, starlings, and sparrows are non-indigenous invasive species that could have numerous detrimental impacts to public health and safety, property, and natural and agricultural resources, and are considered an undesirable component of North American wild and native ecosystems (Executive Order 13112). Thus, these species are unnatural and undesirable at any site and should never be relocated. Additionally, all feral pigeons are essentially homing pigeons and would return to their birth place (Weber 1979).

### **2.4.7 Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area.**

Some individuals might question whether preparing an EA for an area as large as the Commonwealth of Virginia (26 million acres) would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing

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impacts for the entire State may provide a better analysis than multiple EA's covering smaller zones. In addition, Virginia WS only conducts pigeon, starling, or sparrow damage management in a very small area of the Commonwealth where damage is occurring or likely to occur (see Section 1.5) and damage may occur anywhere in the Commonwealth (see Section 1.9.5).

## **CHAPTER 3: ALTERNATIVES**

### **3.0 INTRODUCTION**

This chapter consists of 6 parts: 1) an introduction, 2) description of alternatives considered and analyzed in detail including the Proposed Action (Alternative 3), 3) a description of alternatives considered, but eliminated from detailed analysis, 4) Damage management approaches used by WS, 5) Damage management methods authorized for use or recommended, and 6) a table of mitigation measures and SOP. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), "*Methods of Control*" (USDA 1997 Appendix J) and the "*Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program*" (USDA 1997, Appendix P) of USDA (1997). The five alternatives analyzed in detail are:

- Alternative 1 - No WS Pigeon, Starling, or Sparrow Damage Management in Virginia. This alternative would result in no assistance from WS in managing pigeon, starling, or sparrow damage in Virginia. WS would not provide technical assistance or operational damage management services.
- Alternative 2 - Only Lethal Pigeon, Starling, and Sparrow Damage Management. Under this alternative, only lethal direct operational damage management services and technical assistance would be provided by WS.
- Alternative 3 - Continue the Current Fully Integrated Pigeon, Starling, and Sparrow Damage Management for all Land Classes (No action/Proposed Action). This alternative is the proposed action and is the preferred alternative of WS because it incorporates the use of both nonlethal and lethal methods as appropriate to reduce damage associated with pigeons, starlings, and sparrows in the Commonwealth of Virginia as requested and appropriate.
- Alternative 4 - Technical Assistance Only. Under this alternative, WS would not conduct operational pigeon, starling, or sparrow damage management in Virginia. The entire program would consist of technical assistance.
- Alternative 5 - Nonlethal Pigeon, Starling, and Sparrow Damage Management. This alternative would not allow the use of lethal methods by WS as described under the proposed action. Only nonlethal methods could be implemented by Virginia WS to relieve damage caused by pigeons, starlings, or sparrows.

### **3.1 ALTERNATIVES CONSIDERED, INCLUDING THE PROPOSED ACTION**

#### **3.1.1 Alternative 1. No WS Pigeon, Starling, or Sparrow Damage Management in Virginia**

This alternative would result in no assistance from WS in reducing pigeon, starling, or sparrow damage in

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Virginia. WS would provide no technical assistance or operational damage management services.

All requests for pigeon, starling, or sparrow damage management assistance would not be responded to by WS and would be referred to the VDACS, local animal control agencies, or private businesses or organizations. Assistance may or may not be available from any of these entities. Damage management methods could be implemented by resource owners, private businesses, or volunteers.

### **3.1.2 Alternative 2. Only Lethal Pigeon, Starling, and Sparrow Damage Management**

Under this alternative, only lethal operational pigeon, starling, and sparrow damage management and technical assistance would be provided by WS. Requests for information regarding nonlethal management approaches would be referred to VDACS, local animal control agencies, or private businesses or organizations. Individuals or agencies might choose to implement WS lethal recommendations, implement nonlethal methods or other methods not recommended by WS, contract for WS damage management services, use contractual services of private businesses, use volunteer services of private organizations, or take no action. WS damage management services would be conducted as authorized by various federal and state regulations and would be fully funded by service recipients. WS technical assistance would be funded through WS appropriations. This alternative would not allow WS to consider the use of physical exclusion or harassment, even where these nonlethal methods may be beneficial. Lethal methods used by WS would include shooting, trapping, and pesticide application.

### **3.1.3 Alternative 3. Continue the Current Fully Integrated Pigeon, Starling, and Sparrow Damage Management for all Land Classes (No Action /Proposed Action)**

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)) and is a viable and reasonable alternative that could be selected and serves as a baseline for comparison with the other alternatives. The No Action Alternative, as defined here, is consistent with CEQ (1981).

This alternative is the proposed action and the current program and is the preferred alternative of WS because it incorporates an IWDM approach using effective methods, as appropriate, to reduce conflicts associated with pigeons, starlings, and sparrows in the Commonwealth of Virginia. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, other species, and the environment. Under this alternative, WS would provide both technical assistance and operational damage management services. Nonlethal methods would be given first consideration in the formulation of each damage management strategy, and would be recommended or implemented when practical and effective before recommending or implementing lethal methods. However, nonlethal methods would not always be applied as a first response to each damage problem. When appropriate, physical exclusion or harassment would be recommended and utilized to minimize pigeon and starling damage. In other situations, pigeons, starlings, and sparrows would be humanely removed using traps, shooting, and pesticides. The most appropriate response could often be a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. In some cases, a combination of lethal removal and nonlethal options may provide the best solution.

### **3.1.4 Alternative 4 - Technical Assistance Only.**

This alternative would only allow Virginia WS to provide technical assistance and make recommendations to individuals or agencies requesting pigeon, starling, or sparrow damage management

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in Virginia. However, private landowners, contractors, or others could conduct their own damage management on federal, state, county, and private lands.

The “*technical assistance only*” alternative would place the immediate burden of operational damage management work on other federal, state or county agencies, private businesses, and property owners. Individuals experiencing pigeon, starling, or sparrow damage would, independently or with Virginia WS recommendations, carry out and fund damage management activities. Individuals or agencies could implement damage management as part of the cost of doing business or assume a more active role in providing operational damage management. If this alternative were selected, Virginia WS could not, however, direct how State or county agencies or property owners could implement damage management. Some agencies or property owners may choose not to take action to resolve pigeon, starling, or sparrow damage problems while other situations may warrant the use of legally available management methods because of public demands.

### **3.1.5 Alternative 5 - Nonlethal Pigeon, Starling, and Sparrow Damage Management.**

Under this alternative, only nonlethal management approaches would be used or recommended by WS. Both technical assistance and operational damage management services would be provided. WS technical assistance would be funded through WS appropriations. Requests for lethal wildlife damage management services would be referred to the VDACS or private businesses.

## **3.2 PIGEON, STARLING, AND SPARROW DAMAGE MANAGEMENT APPROACHES USED BY WS.**

Wildlife damage management is defined as the alleviation of damage or other problems caused by or related to the presence of wildlife (USDA 1997). The wildlife damage management approaches used by WS are described below:

### **3.2.1 Integrated Wildlife Damage Management**

During more than 80 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods of reducing damage (USDA 1997). WS's efforts have involved the research and development of new methods, and the implementation of effective strategies to reduce and prevent wildlife damage.

Usually, the most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (WS Directive 2.105), to reduce damage through the WS Decision Model (Slate et al. 1992) discussed on page 3-4.

The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques for the specific situations. IWDM may incorporate cultural practices, habitat modification, animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

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### **3.2.2 Integrated Pigeon, Starling, and Sparrow Damage Management Strategies used by WS consist of:**

- **Technical Assistance Recommendations** (implementation is the responsibility of the requester): WS personnel provide information, instructional sessions, demonstrations and advice on available pigeon and starling damage management techniques. Technical assistance includes demonstrations on the proper use of management devices (pyrotechnics, exclusion devices, traps, etc.), wildlife habits and biology, habitat management, and animal behavior modification. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Bulletins and leaflets on pigeon, starling, and sparrow biology may be sent to citizens to inform them about types of damage and damage management methods. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on factors such as need and practical application. Technical assistance may require substantial effort by WS personnel in the decision making process, but the actual work is the responsibility of the requester.
- **Direct Damage Management Assistance** (management conducted or supervised by WS personnel): Direct damage management assistance is implemented when the problem cannot be resolved through technical assistance and when Cooperative Agreements provide for WS operational assistance. The initial investigation explores and defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Professional skills of WS personnel are often required to resolve problems effectively and safely, especially if restricted pesticides are required or if the problem requires the direct supervision of a wildlife professional. WS considers the biology and behavior of the damaging species, and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategy (ies) may include any

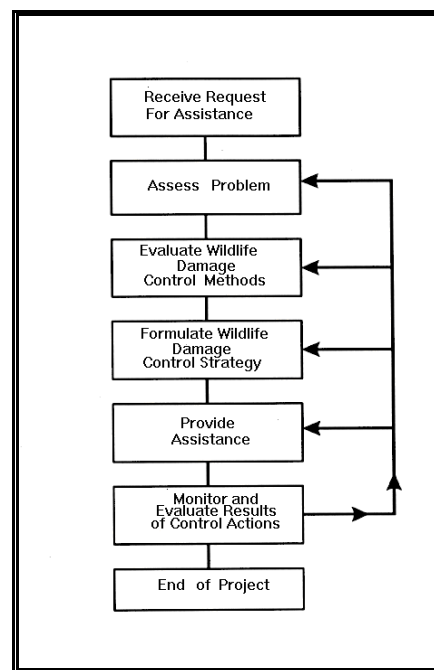
combination of preventive actions, generally implemented by the property owner, and corrective actions, generally implemented by WS. Corrective damage management is applying management techniques to stop or reduce current losses. As requested and appropriate, WS personnel may provide nonlethal and lethal information, conduct demonstrations, or take action to prevent additional losses from recurring.

### **3.2.3 WS Decision Making**

The procedures used by WS personnel to determine management strategies or methods applied to specific damage problems can be found in USDA (1997 Appendix N ).

The WS Decision Model (Figure 3-1) considers the following factors before selecting or recommending damage management methods and techniques:

- Species responsible for the damage
- Magnitude, geographic extent, frequency, historical damage and duration of the problem
- Status of target and non-target species, including T&E species
- Local environmental conditions



**Figure 3-1**  
WS Decision Model

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- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of damage management option<sup>2</sup>

The decision making process is a procedure for evaluating and responding to damage complaints. WS personnel are frequently contacted after requesters have tried nonlethal techniques and found them to be inadequate for reducing damage to an acceptable level. Personnel assess the problem, methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situations are formed into a management strategy. After the management strategy has been implemented, monitoring and evaluation of the strategy is conducted to assess the effectiveness of the strategy. If the strategy is effective, the present need for management is ended.

When damage continues intermittently over time, WS personnel and the requester monitor and reevaluate the situation. If one method or combination of methods fail to stop damage, a different strategy is implemented. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of a continuous feedback loop between receiving the request and monitoring the results, with the damage management strategy reevaluated and revised periodically if necessary.

### **3.3 PIGEON, STARLING, OR SPARROW DAMAGE MANAGEMENT METHODS AUTHORIZED FOR USE OR RECOMMENDED**

USDA (1997 Appendix J) describes methods currently used by the WS program. Several of these were considered in this assessment because of their potential use in reducing pigeon, starling, and sparrow damage to property, natural and agricultural resources, and public health and safety. A listing and more detailed description of the methods used by Virginia WS for pigeon, starling, and sparrow damage management is found in Appendix B of this EA.

#### **3.3.1 Nonlethal Pigeon, Starling, or Sparrow Damage Management Methods:**

**Habitat Modification** refers to the elimination of feeding, watering, roosting, loafing, and nesting sites for pigeons, starlings, or sparrows. This would include discouraging people from feeding pigeons, starlings, and sparrows and cleaning up spilled grain around feeders, grain mills, railcar loading areas, etc., and cleaning up spilled garbage or open garbage containers. Buildings, structures, and architectural designs can be modified to reduce the attractiveness to pigeons (Williams and Corrigan 1994). Thinning trees or branches from woodlots used as starling roosts may help to disperse the roost (Johnson and Glahn 1994). Tall grass management (7-14 inches) could reduce foraging areas for starlings, pigeons, and sparrows.

**Exclusion** involves preventing pigeons, starlings, or sparrows from gaining access to roosting and loafing sites by sealing doorways, windows, and other openings. This may require extensive renovations or may be as simple as closing a window or sealing a crack or crevice.

**Harassment/Scaring** involves the use of devices such as pyrotechnics, propane cannons, distress calls, lights, eye-spot balloons, mylar tape, and effigies. Harassment is considered ineffective on pigeons (Courtsal 1983) and sparrows (Fitzwater 1994), but persistent harassment could be used to disperse

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<sup>2</sup>The cost of management may sometimes be secondary because of overriding environmental, legal, public health and safety, animal welfare or other concerns

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starling roosts (Johnson and Glahn 1994).

**Repellents** could be either tactile or mechanical. Tactile repellents include the various nontoxic, sticky surfaces (e.g., 4 the Birds™, Hotfoot™, Tanglefoot™, Roost No More™, and Bird-Proof™) that encourage pigeons, starlings, and sparrows to find alternate roosting and loafing sites (Fitzwater 1994, Johnston and Glahn 1994, Williams and Corrigan 1994). Mechanical repellents such as porcupine wires (Cat Claw™, Nixalite™) or Bird Barrier™ can be used to exclude pigeons, starlings, and sparrows from landing at loafing or roosting sites (Fitzwater 1994, Johnson and Glahn 1994, Williams and Corrigan 1994). Parallel wires, overhead monofilament grids, and electric shock bird control systems (Avi-Away™, Flyaway™, and Vertebrate Repellent System [VRS™]) could also be used to exclude or repel pigeons (Williams and Corrigan 1994) or sparrows (Fitzwater 1994).

### **3.3.2 Lethal Pigeon, Starling, or Sparrow Damage Management Methods:**

These methods involve damage management specifically designed to lethally remove pigeons, starlings, or sparrows in certain situations to a level that stabilizes, reduces, or eliminates damage. The level of population reduction necessary to achieve a reduction of pigeon, starling, or sparrow damage varies according to the resource protected, habitat, species population, the effectiveness of other damage management strategies, and other population factors.

**Shooting** is selective for the target species and may involve the use of either a shotgun or precision air rifle. Shooting at some roost sites could result in a reduction in the local pigeon population, but shooting would not generally be effective to reduce starling populations in most situations because of the large numbers of birds involved and their behavioral characteristics. However, shooting would supplement harassment programs for starlings (Johnson and Glahn 1994). Shooting can also be used to reduce sparrow damage, although the use of a blind is recommended because sparrows quickly become wary of humans (Fitzwater 1994).

**Trapping** may include the use of funnel entrance traps, decoy traps, and Australian crow traps baited with a grain attractive to pigeons or starlings (Johnson and Glahn 1994, Williams and Corrigan 1994). Trapping could also include the use of cannon/rocket nets to capture pigeons. Mist nets, funnel traps, and automatic traps (counter-balanced multicatch traps) could be used to capture sparrows (Fitzwater 1994). Pigeons, starlings, and sparrows would be euthanized by methods approved by the AVMA (1993) or a veterinarian.

**Nest Destruction** could be used to discourage sparrows from using an area. The young and/or eggs are destroyed and the nest is removed approximately every 2 weeks throughout the breeding season because sparrows are very persistent and will attempt to re-nest at the same location (Fitzwater 1994, Weber 1979). Destruction of pigeon nests at 2-week intervals may also be beneficial, but should be used in combination with other damage control methods (Williams and Corrigan 1994).

**3.3.3 Chemical Management Methods (DRC-1339 and Avitrol)** could be used to reduce damage from pigeons, starlings, and sparrows. All chemicals used by Virginia WS are registered under FIFRA and administered by the EPA and the VDACS or are approved by the FDA. All WS personnel in Virginia are certified as restricted-use pesticide applicators by the VDACS. No chemicals are used on public or private lands without authorization from the land management agency or property owner/manager.

Pre-baiting would be conducted in compliance with appropriate EPA labeling instructions at strategic locations utilized by pigeons, starlings, and sparrows. Observations of bird activity at these locations

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would be made prior to treatment with a pesticide to ensure that non-target species would not be affected. DRC-1339 and/or Avitrol would be applied according to EPA label guidelines and restrictions. Treatment sites would be monitored to determine the effectiveness of the treatment and to prevent take of non-target birds.

**Avitrol (4-Aminopyridine).** Avitrol is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Prebaiting is usually necessary to achieve effective bait acceptance by the target species. Avitrol treated bait is placed in an area where the targeted birds are feeding and usually a few birds will consume a treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby, frightening the remaining flock away.

**DRC-1339 (Starlicide®).** DRC-1339 is the principal chemical method that would be used for starling and pigeon damage management in the proposed action. For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966).

DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including starlings and pigeons. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to non-sensitive birds, predatory birds, and mammals.

DRC-1339 has several EPA Registration Labels (56228-10, 56228-17, 56228-28, 56228-29, and 56228-30) depending on the application or species involved in the damage reduction project. Virginia WS used an average of 347 grams of DRC-1339 per year for the past 3 years for reduction of damage caused by starlings (17%) and pigeons (83%) (MIS 1997, 1998, 1999).

### **3.4 METHODOLOGIES CONSIDERED BUT DEEMED IMPRACTICAL, INEFFECTIVE, OR UNSAFE AT THE PRESENT TIME:**

**3.4.1 Reproduction control** - No reproductive inhibitor for pigeons, starlings, or sparrows is currently registered by the EPA. Ornitol, was previously registered as a reproductive inhibitor for pigeons, but this registration has been discontinued. Ornitol did not stop pigeons from reproducing, and resulted in bait aversion and some mortality among treated pigeons (Erikson and Jackson 1983).

### **3.5 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONALE**

**3.5.1 Population stabilization through birth control.** Under this alternative, pigeon, starling, and sparrow populations would be managed through the use of contraceptives. Pigeons, starlings, or sparrows would be sterilized or contraceptives administered to limit their ability to produce offspring. However, at present, there are no chemical or biological contraceptive agents for pigeons, starlings, or sparrows. A pigeon, starling, or sparrow contraceptive or chemosterilant, if delivered to a sufficient number of individuals, could temporarily suppress local breeding populations by inhibiting reproduction. Reduction of local populations would result from natural mortality combined with reduced fecundity. No pigeons, starlings, or sparrows would be killed directly with this method, however, and these birds would continue to cause damage. Populations of dispersing pigeons, starlings, and sparrows would probably be

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unaffected.

The use of contraceptives is not realistic, at this point, since there are no effective contraceptives nor legal methods of delivering contraceptives to pigeons, starlings, or sparrows.

### **3.6 MITIGATION AND SOPs FOR PIGEON, STARLING, AND SPARROW DAMAGE MANAGEMENT**

#### **3.6.1 Mitigation and SOPs**

Mitigation measures are any feature of an action that serves to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS program, nationwide and in Virginia, uses many such mitigation measures and these are discussed in detail in Chapter 5 of USDA (1997). The following mitigating measures are incorporated into WS's SOPs and Alternatives 2,3,4, and 5:

Alternative 1 - No WS Pigeon, Starling, or Sparrow Damage Management in Virginia.

Alternative 2 - Only Lethal Pigeon, Starling, and Sparrow Damage Management.

Alternative 3 - Fully Integrated Wildlife Damage Management for all Land Classes (Proposed Action).

Alternative 4 - Technical Assistance Only.

Alternative 5 - Nonlethal Pigeon, Starling, and Sparrow Damage Management.

**Table 3-1. Mitigation Measures.**

MITIGATION MEASURES	ALTERNATIVES				
	1	2	3	4	5
<b><i>Animal Welfare and Humaneness of Methods Used by WS</i></b>					
Research on selectivity and humaneness of management practices would be monitored and adopted as appropriate.		X	X	X	X
The Decision Model (Slate et al. 1992) would be used to identify effective biologically and ecologically sound damage management strategies and their impacts.		X	X	X	X
Captured non-target animals would be released unless it is determined by the Virginia WS personnel that the animal would not survive.		X	X		
Euthanasia procedures used by WS would be approved by the AVMA or a veterinarian		X	X		
The use of newly-developed, proven, nonlethal methods would be encouraged when appropriate.		X	X	X	X
<b><i>Safety Concerns Regarding WS' Pigeon, Starling, and Sparrow Damage Management Methods</i></b>					
All pesticides used by WS would be registered with the EPA and VDACS.		X	X		
EPA-approved label directions would be followed by WS employees.		X	X		

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MITIGATION MEASURES	ALTERNATIVES				
	1	2	3	4	5
Pigeon, starling, and sparrow damage management conducted on public lands would be coordinated with the management agency.		X	X		X
WS employees that use pesticides would be trained to use each material and would be certified to use pesticides under EPA approved certification programs.		X	X		
WS employees, who use pesticides, would participate in VDACS approved continuing education to keep abreast of developments and maintain their certifications.		X	X		
Live traps would be placed so that captured animals would not be readily visible from any road or public area.		X	X		
Pesticide use, storage, and disposal would conform to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.		X	X		
Material Safety Data Sheets for pesticides would be provided to all WS personnel involved with specific bird damage management activities.		X	X	X	
<b><i>Concerns about Impacts of Pigeon, Starling, and Sparrow Damage Management on T&amp;E Species, Species of Special Concern, and Non-target Species.</i></b>					
WS consulted with the USFWS regarding the nation-wide program and would continue to implement all applicable measures identified by the USFWS to ensure protection of T&E species.		X	X		X
Management actions would be directed toward localized populations or groups		X	X		X
WS personnel would be trained and experienced to select the most appropriate method for taking targeted animals and excluding non-target species.		X	X		X
WS would initiate informal consultation with the USFWS following any incidental take of T&E Species.		X	X		

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### CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

#### 4.0 INTRODUCTION

Chapter 4 provides information for making informed decisions on the pigeon, starling, and sparrow damage management program outlined in Chapter 1, and the issues and affected environment discussed in Chapter 2. This chapter consists of: 1) analysis of each alternative against the issues considered in detail and 2) analysis of the environmental consequences of each alternative.

#### 4.1 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences using Alternative 3 (the current program) as the baseline comparing the other alternatives to determine if the real or potential impacts are greater, lesser or the same (Table 4-4).

The following resource values within Virginia would not be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

**4.1.1 Social and Recreational Concerns** are discussed throughout the document as they relate to issues raised during public involvement, and they are discussed in USDA (1997).

**4.1.2 Cumulative and Unavoidable Impacts** are discussed in relationship to each of the wildlife species and the environmental impacts are analyzed in this chapter. This EA recognizes that the total annual removal of individual animals from wildlife populations by all causes is the cumulative mortality. Analysis of the Virginia WS “takes” during 1997, 1998 and 1999 (Table 2-1), in combination with other mortality, indicates that cumulative impacts are not significant. It is not anticipated that the Virginia WS program would result in any adverse cumulative impacts to T&E species and pigeon, starling, and sparrow damage management does not jeopardize public health and safety.

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**4.1.3 Irreversible and Irretrievable Commitments of Resources:** Other than minor uses of fuels for motor vehicles and electrical energy for office maintenance, there are no irreversible or irretrievable commitments of resources. Based on these estimates, the Virginia WS program produces very negligible impacts on the supply of fossil fuels and electrical energy.

## **4.2 ISSUES ANALYZED IN DETAIL**

This section presents the expected consequences of each alternative on each of the issues analyzed in detail.

### **4.2.1 Alternative 1. No WS Pigeon, Starling, or Sparrow Damage Management in Virginia**

Effects on other wildlife species, including T&E species. There could be effects on other wildlife species, in that starlings and sparrows would continue to compete with native birds for nest sites. Also, without assistance from WS, some members of the public may be more likely to take illegal and harmful measures such as misusing toxic chemicals in an attempt to alleviate pigeon, starling, or sparrow damage.

Effects on public health and safety. The threat of disease transmission to humans (e.g. Histoplasmosis, Ornithosis, Cryptococcosis, Toxoplasmosis) would continue or increase due to increased amounts of fecal accumulation or the contamination of manufactured goods, pharmaceuticals, and food products produced or stored in buildings. Additionally, there would be an increased threat of pigeon, starling, or sparrow aircraft strikes if pigeon, starling, or sparrow populations are not dispersed or reduced at and around airports. Hazardous working conditions from accumulations of slippery fecal droppings on stairways and catwalks would continue to exist.

Impact to stakeholders, including aesthetics. The impacts of this alternative to stakeholders would be variable depending on the damage situation, their values towards wildlife, and their compassion for their neighbors. Resource owners who are receiving damage from pigeons, starlings, or sparrows would likely strongly oppose this alternative because they would bear the damage caused by pigeons, starlings, and sparrows. Animal activists and some bird enthusiasts would prefer this alternative because activists believe it is morally wrong to kill or use animals for any reason. Some bird enthusiasts derive great enjoyment from feeding and viewing birds. Some people would support this alternative because they enjoy seeing pigeons, starlings, or sparrows or having them nearby. However, while WS would take no action under this alternative, other individuals or entities may conduct damage management activities.

### **4.2.2 Alternative 2. Only Lethal Pigeon, Starling, and Sparrow Damage Management**

Effects on other wildlife species, including T&E species. Local population reductions of pigeons, starlings, or sparrows may reduce the local prey base for some predators such as hawks and falcons. Local population reductions of starlings and sparrows would reduce competition with native bird species for nest sites. No adverse effects on T&E species are expected because of mitigation measures. Terwilliger (1991), Terwilliger and Tate (1995), and the USFWS list of federal T&E species for Virginia (<http://www.fws.gov/r9endspp/endspp.html>) were reviewed to identify federal and state T&E species in Virginia. The USFWS and VDGIF were consulted on the impacts of this program on possibly affected T&E species.

Effects on public health and safety. There would be a reduction in threats to public health and safety. There would be an improvement in work place safety because of the elimination or reduction of hazardous work conditions such as accumulations of slippery bird droppings on stairways and catwalks. There would be a reduction in the disease threat because fewer fecal droppings would accumulate therefore

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reducing risk of inhaling or ingesting pathogens from fecal droppings. There would be a reduction in the risk of aircraft strikes at airports.

Impact to stakeholders, including aesthetics. The impacts of this alternative to stakeholders would be variable depending on their values towards wildlife and their compassion for their neighbors. This alternative would likely be favored by resource owners who are receiving damage. Animal activists would strongly oppose this alternative because they believe it is morally wrong to kill or use animals for any reason. Some bird enthusiast would strongly oppose this alternative because they believe the opportunity to view or feed pigeons, starlings, or sparrows would be reduced or eliminated.

The ability to view and esthetically enjoy pigeons, starlings, or sparrows at a particular site would be more limited if the pigeons, starlings, or sparrows are removed. New pigeons, starlings, or sparrows, however, would most likely use the site in the future, although the length of time until these birds arrive is variable, depending on the site, time of year, and population densities of pigeons, starlings, or sparrows in surrounding areas. The opportunity to view pigeons, starlings, and sparrows is available if a person makes the effort to visit sites outside of the damage management area.

### **4.2.3 Alternative 3 - Continue the Current Fully Integrated Pigeon, Starling, and Sparrow Damage Management (IWDMM) for all Land Classes (No Action /Proposed Action).**

Effects on other wildlife species, including T&E species. Local population reductions of pigeons, starlings, or sparrows may reduce the local prey base for some predators such as hawks and falcons. Local population reductions of starlings and sparrows would reduce competition with native bird species for nest sites. No adverse effects on T&E species are expected because of mitigation measures. Terwilliger (1991), Terwilliger and Tate (1995), and the USFWS list of federal T&E species for Virginia (<http://www.fws.gov/r9endspp/endspp.html>) were reviewed to identify federal and state T&E species in Virginia. The USFWS and VDGIF were consulted on the impacts of this program on possibly affected T&E species.

Effects on public health and safety. There would be a reduction in threats to public health and safety and an improvement in work place safety because of the elimination or reduction of hazardous work conditions such as accumulations of slippery bird droppings on stairways and catwalks. There would be a reduction in the disease threat because fewer fecal droppings would accumulate therefore reducing risk of inhaling or ingesting pathogens from fecal droppings. There would be a reduction in the risk of aircraft strikes at airports.

Impact to stakeholders, including aesthetics. The impacts of this alternative to stakeholders would be variable depending on the damage situation, their values towards wildlife, and their compassion for their neighbors. This alternative would likely be favored by resource owners who are receiving damage. Animal activists would oppose this alternative because they believe it is morally wrong to kill or use animals for any reason. Some bird enthusiast would oppose this alternative because they believe the opportunity to view or feed pigeons, starlings, or sparrows would be reduced or eliminated.

The ability to view and esthetically enjoy pigeons, starlings, or sparrows at a particular site would be somewhat limited if the pigeons, starlings, or sparrows are removed. New pigeons, starlings, or sparrows, however, would most likely use the site in the future, although the length of time until these birds arrive is variable, depending on the site, time of year, and population densities of pigeons, starlings, or sparrows in surrounding areas. The opportunity to view pigeons, starlings, and sparrows is available if a person

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makes the effort to visit sites outside of the damage management area.

### **4.2.4 Alternative 4 - Technical Assistance Only.**

Effects on other wildlife species, including T&E species. The effects would be variable depending on the action and scope of the problem. Some people would resolve their problem and have no adverse impacts on other wildlife or T&E species. Some people would be frustrated at their inability to reduce damage and may use methods that are illegal or harmful to other wildlife.

Effects on public health and safety. The effects would be variable depending on the action and scope of the problem. Some people or businesses would be able to reduce threats to public health or safety. Some people or businesses would be frustrated at their inability to reduce threats to public health or safety. Some people or businesses would not have the time, expertise, or access to some control methods to reduce threats to public health or safety.

Impact to stakeholders, including aesthetics. The impacts of this alternative to stakeholders would vary depending on the damage management efforts employed by resource owners, their values toward wildlife and compassion for their neighbors. Some resource owners who are receiving damage from pigeons, starlings, or sparrows would likely find this management alternative incomplete because they lack the time, expertise, or access to some control methods to reduce damage without WS operational assistance. Some people would support this alternative because they believe resource owners would do little to remove pigeons, starlings, or sparrows. Others would oppose this alternative because they believe resource owners would use illegal, inhumane, or environmentally unsafe control methods. While WS could only provide technical assistance under this alternative, other individuals or entities could conduct damage management without implementing the recommendations of WS.

### **4.2.5 Alternative 5 - Nonlethal Pigeon and Starling Damage Management.**

Effects on other wildlife species, including T&E species. There would be no probable effect on other wildlife species, except that starlings and sparrows would continue to compete with native birds for nest sites. Also, without assistance from WS, some members of the public may be more likely to take illegal and harmful measures such as misusing toxic chemicals in an attempt to alleviate pigeon, starling, or sparrow damage.

Effects on public health and safety. The threat of disease transmission to humans (e.g. Histoplasmosis, Ornithosis, Cryptococcosis, Toxoplasmosis) could be increased due to increased amounts of fecal accumulation or the contamination of manufactured goods, pharmaceuticals, and food products produced or stored in buildings. Additionally, there would be an increased threat of pigeon or starling - aircraft strikes if pigeon and starling populations are not dispersed or reduced at and around airports. Hazardous working conditions from accumulations of slippery fecal droppings on stairways and catwalks would continue to exist.

Impact to stakeholders, including aesthetics. The impacts of this alternative to stakeholders would be variable depending on the damage management efforts employed by resource owners, their values toward wildlife and compassion for their neighbors. Some resource owners who are receiving damage from pigeons, starlings, or sparrows may oppose this management alternative. Some people would support this alternative because they believe resource owners would do little to remove pigeons, starlings, or sparrows. Others would oppose this alternative because they believe resource owners would use illegal, inhumane, or

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environmentally unsafe methods. While WS could only provide nonlethal assistance under this alternative, other individuals or entities could conduct lethal damage management.

### 4.3 SUMMARY OF WS's IMPACTS

Table 4-3 presents a relative comparison of the anticipated impacts of each of the alternatives as they relate to each of the major issues identified in Chapter 2.

#### 4.3.1 Cumulative Impacts

No significant cumulative environmental impacts are expected from any of the alternatives (Table 4-2). No risk to public health and safety is expected from the proposed alternative (Alternative 3). Although some persons would likely remain opposed to lethal removal of pigeons, starlings or sparrows, the analysis in this EA indicates that such removals will result in no significant cumulative adverse impacts on the quality of the human environment.

Table 4-3. Summary of Anticipated Cumulative Impacts from the Alternatives Analyzed.

Issues/Impacts	Alternative 1: No Program	Alternative 2: Lethal Only	Alternative 3: IWDM Program (Proposed Action)	Alternative 4: Technical Assistance	Alternative 5: Nonlethal Only
Impacts to other wildlife species, including T&E species.	No probable effect. Possible nesting competition with native birds. Some members of the public may misuse toxic chemicals to reduce damage.	No probable effect. Possible local reduction of prey base for some avian predators. Possible reduced competition for nest sites among cavity nesting birds.	No probable effect. Possible local reduction of prey base for some avian predators. Possible reduced competition for nest sites among cavity nesting birds.	Variable, depending on actions taken by property owners. Actions taken by property owners may have no affect or may be harmful to other wildlife.	Possible nesting competition with native birds. Actions taken by property owners may have no affect or may be harmful to other wildlife.

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Public Health and Safety.	Continued threat of disease transmission and hazardous working conditions. Increased risk of bird - aircraft strikes.	Reduced threat of disease transmission and improved working conditions. Reduced risk of bird - aircraft strikes.	Reduced threat of disease transmission and improved working conditions. Reduced risk of bird - aircraft strikes.	Variable, depending on scope of problem and actions taken by property owner. Some people or businesses would not have the expertise or access to control methods.	Variable, depending on scope of problem and actions taken by property owner. Most likely the threat of disease transmission would increase. The threat of bird - aircraft strikes would increase.
Impact to stakeholders, including aesthetics.	Variable. Some people prefer this alternative. Those receiving damage would likely oppose. Some animal activist and bird enthusiasts would support this alternative.	Variable. Those receiving damage would likely prefer this alternative. Some animal activists and bird enthusiasts may oppose.	Variable. Those receiving damage would likely prefer this alternative. Some animal activists and bird enthusiasts may oppose.	Variable. Some unaffected people prefer this alternative. Some people affected with damage will be disappointed with this alternative.	Variable. Some unaffected people prefer this alternative. Some people affected with damage will be disappointed with this alternative.

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## **APPENDIX A**

### **LITERATURE CITED**

- Anonymous. 1998. Histoplasmosis: Prevention and control in Kentucky. *Epidemiologic Notes & Reports*. Vol 33. No. 4. 4 pp.
- Arhart, D. K. 1972. Some factors that influence the response of starlings to aversive visual stimuli. M.S. Thesis. Oregon State Univ., Corvallis.
- AVMA. 1993. Report of the AVMA panel on euthanasia. *J. Am. Vet. Med. Assoc.* 202:229-249.
- Besser, J.F., W.C. Royall, Jr., and J.W. DeGrazio. 1967. Baiting starlings with DRC-1339 at a cattle feedlot. *J. Wildl. Manage.* 31:48-51.
- Bishop, R. C. 1987. Economic values defined. Pages 24 -33 *in* D. J. Decker and G. R. Goff, eds. Valuing wildlife: economic

## ***Pre-Decisional EA***

- and social perspectives. Westview Press, Boulder, CO. 424 p.
- Blanton, K.M., B.U. Constantin, and G.L. Williams. 1992. Efficacy and methodology of urban pigeon control with DRC-1339. Proc. 5<sup>th</sup> East. Wildl. Damage Control Conf. 5:58-62.
- Bomford, M., and P.H. O'Brien. 1990. Sonic deterrents in animal damage control: a review of device tests and effectiveness. Wildl. Soc. Bull. 18:411-422.
- CEQ (Council for Environmental Quality). 1981. Forty most asked questions concerning CEQ's National Environmental Policy Act regulations. (40 CFR 1500-1508) Fed. Reg. 46(55):18026-18038.
- Cleary, E.C., S.E. Wright, and R.A. Dolbeer. 1997. Wildlife Strikes to civil aircraft in the United States 1992-1996. U.S. Dept. of Trans., Federal Aviation Admin. Ser. Rep. No. 3. Washington, D.C. 30 pp.
- Conover, M.R. 1982. Behavioral techniques to reduce bird damage to blueberries: methiocarb and a hawk-kite model. Wildl. Soc. Bull. 10:211-216.
- Constantin, B., and J. Glahn. 1989. Controlling roosting starlings in industrial facilities by baiting. Proc. Eastern Wildl. Damage Control Conf. 4:47-52.
- Courtsal, F.R. 1983. Pigeons (rock doves). Pages E-35-41 in R.M. Timm, ed. Prevention and control of wildlife damage. Great Plains Agr. Council. And Nebraska Coop. Ext. Serv., Univ. Nebraska-Lincoln.
- Cunningham, D.J., E.W. Schafer, Jr., and L.K. McConnell. 1979. DRC-1339 and DRC-2698 residues in starling: Preliminary evaluation of their effects on secondary hazard potential. Pages 31-37 in Proc. Bird Contr. Seminar, Bowling Green, OH. Vol. 8.
- Cunningham, D.J., E.W. Schafer, Jr., and L.K. McConnell. 1981. DRC-1339 and DRC-2698 residues in starlings: preliminary evaluation of their effects on secondary hazard potential. Proc. Bird Control Seminar 8:65-70. Bowling Green, OH.
- Day, G. I., S. D. Schemnitz, and R. D. Taber. 1980. Capturing and marking wild animals. pp. 61-88 in Wildlife management techniques manual. S. D. Schemnitz ed. The Wildl. Soc., Inc. Bethesda, MD. 686 pp.
- DeCino, T.J., D.J. Cunningham, and E.W. Schafer. 1966. Toxicity of DRC-1339 to starlings. J. Wildl. Manage. 30:249-253.
- Decker, D. J. and G. R. Goff. 1987. Valuing Wildlife: Economic and Social Perspectives. Westview Press. Boulder, Colorado, p. 424.
- DeHaven, R.W., and J.L. Guarino. 1969. A nest-box trap for starlings. Bird-Banding 40:48-50.
- Dolbeer, R.A., P.P. Woronecki, and R.L. Bruggers. 1986. Reflecting tapes repel blackbirds from millet, sunflowers, and sweet corn. Wildl. Soc. Bull. 14:418-425.
- Erikson, W.A., and W.B. Jackson. 1983. Use of the chemosterilant Ornitol in feral pigeon (*Columba livia*) control. Proc. Bird Control Seminar. 9:261-269.
- Feare, C.J. 1984. The starling. Oxford Univ. Press, New York. 315 pp.
- Federal Register. 1999a. Final rule to remove the American peregrine falcon from the federal list of endangered and threatened wildlife. Vol. 64, No. 164. pp 46542-46558.
- Federal Register. 1999b. Proposed rule to remove the bald eagle in the Lower 48 states from the list of endangered and threatened wildlife. Vol. 64, No. 128. pp. 36453-36464.
- Fitzwater, W.D. 1994. House Sparrows. pp E-101 to E-108 in S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council

## ***Pre-Decisional EA***

Wildl. Comm., Lincoln, Nebr.

- Fuller-Perrine, L.D., and M.E. Tobin. 1993. A method for applying and removing bird-exclusion netting in commercial vineyards. *Wildl. Soc. Bull.* 21:47-51.
- Glahn, J.F. 1982. Use of starlicide to reduce starling damage at livestock feeding operations. *Proc. Great Plains Wildl. Damage Control Workshop* 5:273-277.
- Glahn, J.F., and D.L. Otis. 1986. Factors influencing blackbird and European starling damage at livestock feeding operations. *J. Wildl. Manage.* 50:15-19.
- Glahn, J.F., and E.A. Wilson. 1992. Effectiveness of DRC-1339 baiting for reducing blackbird damage to sprouting rice. *Proc. East. Wildl. Damage Control Conf.* 5:117-123.
- Glahn, J.F., S.K. Timbrook, and D.J. Twedt. 1987. Temporal use patterns of wintering starlings at a southeast livestock farm: implications for damage control. *Proc. Eastern Wildl. Damage Control Conf.* 3:194-203.
- Gough, P.M., and J.W. Beyer. 1982. Bird-vectored diseases. *Proc. Great Plains Wildl. Damage Control Workshop.* 5:260-272.
- Hill, S.C. 1999. Pigeons foul Belchertown water. *Daily Hampshire Gazette.* October 29, 1999.
- Holler, N.R., and E.W. Schafer, Jr. 1982. Potential secondary hazards of avitrol baits to sharp-shinned hawks and American kestrels. *J. Wildl. Manage.* 46:457-462.
- Huesmann, H.W., and R. Bellville. 1978. Effects of nest removal on starling populations. *Wilson Bull.*; 90(2): 287-290.
- Johnson, R.J., and J.F. Glahn. 1994. European starlings. pp E-109 to E-120 *in* S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.
- Knittle, C.E., and J.L. Guarino. 1976. A 1974 questionnaire survey of bird damage to ripening grain sorghum in the United States. *Sorghum newsletter*, Vol. 19.
- Knittle, C.E., J.L. Guarino, P.C. Nelson, R.W. Dehaven, and D.J. Twedt. 1980. Baiting blackbird and starling congregating areas in Kentucky and Tennessee. *Proc. Vert. Pest Conf.* 9:31-37.
- Lenhart, S.W., M.P. Schafer, M. Singal, and R.A. Hajjeh. 1997. Histoplasmosis: Protecting workers at risk. U.S. Dept. of Health and Human Services. Publ. No. 97-146. Cincinnati, OH. 22 pp.
- McCracken, H. F. 1972. Starling control in Sonoma county. *Proc. Vertebr. Pest Conf.* 5:124-126.
- McLean, R.G. 1994. Wildlife diseases and humans. pp A-25 to A-41 *in* S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.
- Mott, D.F. 1985. Dispersing blackbird - starling roosts with helium-filled balloons. *Proc. East Wildl. Damage Control Conf.* 2:156-162.
- Nielsen, L. 1988. Definitions, considerations, and guidelines for translocation of wild animals. Pages 12-49 *in* Translocation of Wild Animals. Edited by L. Nielsen and R. D. Brown. WI Humane Society, Inc. and Ceaser Kleberg Wildlife Research Instit. 333 p.
- Robbins, C.S., B. Brunn, and H.S. Zim. 1983. *Birds of North America: A guide to field identification*. Western publishing Co., Inc., racine, Wisconsin.

### ***Pre-Decisional EA***

- Roszbach, R. 1975. Further experiences with the electroacoustic method of driving starlings from their sleeping areas. *Emberiza* 2:176-179.
- Royall, W.C., Jr., T.C. DeCino, and J.F. Besser. 1967. Reduction of a starling population at a turkey farm. *Poultry Sci.* 46:1494-1495.
- Sauer, J.R., J.E. Hines, G.Gough, I. Thomas, and B.G. Peterjohn. 1997. The North American breeding bird survey results and analysis. Version 96.4 Patuxent Wildlife Research Center, Laurel, MD.
- Schafer, E.W., Jr. 1981. Bird control chemicals - nature, modes of action and toxicity. In Handbook Series in Agriculture. Vol. III, A.A. Hanson, Ed., CRC Press, West palm Beach, FL. Pgs. 129-139.
- Schafer, E.W., Jr. 1991. Bird control chemicals - nature, mode of action, and toxicity. Pages 599-610 in CRC handbook of pest management in agriculture. Vol. 2 D. Pimentel (ed.) CRC Press. Cleveland, OH.
- Schafer, E.W., Jr., R.B. Brunton, and N.F. Lockyer. 1974. Hazards to animals feeding on blackbirds killed with 4-aminopyridine baits. *J. Wildl. Manage.* 38:424-426.
- Schmidt, R. H. 1989. Animal welfare and wildlife management. *Trans. N. A. Wildl. And Nat. Res. Conf.* 54:468-475
- Schmidt, R.H., and R.J. Johnson. 1984. Bird dispersal recordings: an overview. *Am. Soc. Testing Mat. STP 817*, Philadelphia, Pennsylvania. 4:43-65.
- Shirota, Y., M. Sanada, and S. Masaki. 1983. Eyespotted balloons as a device to scare gray starlings. *Applied Entomolgy and Zoology.* 18:545-549.
- Seamans, T.W., D.W. Hamerschock, and G.E. Bernhardt. 1995. Determination of body density for twelve bird species. *Ibis* 137:424-428.
- Slate, D. A., R. Owens, G. Connolly and G. Simmons. 1992. Decision making for wildlife damage management. *Trans. North Am. Wildl. Nat. Res. Conf.* 57:51-62.
- Stickley, A.R., and R.J. Weeks. 1985. Histoplasmosis and its impact on blackbird-starling roost management. *Proc. Eastern Wildl. Damage Control Conf.* 2:163-171.
- Terwilliger, K. 1991. Virginia's Endangered Species: Proceedings of a symposium. McDonald and Woodward Publ. Blacksburg, VA 638 p.
- Terwilliger K. and J. R. Tate. 1995. A guide to endangered and threatened species in Virginia. McDonald and Woodward Publ. Blacksburg, VA. 220 p.
- The Wildlife Society. 1992. Conservation policies of The Wildlife Society: A stand on issues important to wildlife conservation. The Wildlife Society, Bethesda, Md. 24pp.
- Timm, R.M. 1994. Description of active ingredients. pp G-23 to G-61 in S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.
- Tobin, M.E., P.P. Woronecki, R.A. Dolbeer, and R.L. Bruggers. 1988. Reflecting tape fails to protect ripening blueberries from bird damage. *Wildl. Soc. Bull.* 16:300-303.
- USDA. 1999. USDA, Animal and Plant Health Inspection Service, Animal Damage Control Strategic Plan. USDA, APHIS, ADC (WS), Operational Support Staff, 6505 Belcrest RD, Room 820 Federal Bldg, Hyattsville, MD 20782.
- USDA (U. S. Department of Agriculture). 1997. Revised: Animal Damage Control Program Final Environmental Impact Statement. Vol. 1-3. Animal and Plant Health Inspection Service, Hyattsville, MD.

### ***Pre-Decisional EA***

- USDI. 1992. Biological Opinion. Animal Damage Control Program U.S. Fish and Wildlife Service, Washington D.C.
- U.S. Fish & Wildlife Service. 1981. Domestic Pigeon. USDI,, 4 pp.
- Weber, W.J. 1979. Health hazards from pigeons, starlings, and English sparrows. Thomson Pub. Fresno, CA 138 pp.
- West, R.R., J.F. Besser, and J.W. DeGrazio. 1967. Starling control in livestock feeding areas. Proc. Vertebr. Pest. Conf., 3:89-93.
- White, S. B., R.A. Dolbeer, and T.A. Bookhout. 1985. Ecology, bioenergetics, and agricultural impacts of a winter-roosting population of blackbirds and starlings. Wildl. Monogr. 93. 42 pp.
- Williams, D.E., and R.M. Corrigan. 1994. Pigeons (Rock Doves). pp E-87 to E-96 in S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.
- Wywialowski, A. P. 1991. Implications of the animal rights movement for wildlife damage management. Proceed. of the Great Plains Conf. 10:28-32.

## **APPENDIX B**

### **METHODS USED BY VIRGINIA WS FOR PIGEON, STARLING, AND SPARROW DAMAGE MANAGEMENT**

Resource owners and government agencies have used a variety of techniques to reduce pigeon, starling, and sparrow damage. However, all lethal and nonlethal methods developed to date have limitations based on costs, logistics, or effectiveness. Below is a discussion of pigeon, starling, and sparrow damage management methods available to the Virginia WS Program.

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### **NON-LETHAL METHODS**

**Habitat Modification** refers to the elimination of feeding, watering, roosting, loafing, and nesting sites for pigeon, starlings, or sparrows. This would include discouraging people from feeding pigeons, starlings, and sparrows and cleaning up spilled grain around feeders, grain mills, railcar loading areas, etc., and cleaning up spilled garbage or open garbage containers. Buildings, structures, and architectural designs can be modified to reduce the attractiveness to pigeons (Williams and Corrigan 1994). Additional husbandry practices include, but are not limited to, techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Environmental/Habitat/Behavior modification is an integral part of bird damage management. The type, quality, and quantity of habitat are directly related to the wildlife that are produced. Therefore, habitat can be managed to not produce or attract certain bird species or to repel certain birds. Most habitat management revolves around airports and bird aircraft strike problems and starling winter roosts. Habitat management around airports is aimed at eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from runway areas. For example, tall grass management (7-14 inches) could reduce foraging areas for starlings, pigeons, and sparrows. Habitat management is often necessary to minimize damage caused by starlings that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is the only way to permanently stop such activity (USDA 1997).

**Lure crops** or alternate foods may be used to mitigate the loss potential when depredations cannot be avoided by careful crop selection or modified planting schedules. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area.

**Exclusion** involves preventing pigeons, starlings, or sparrows from gaining access to roosting and loafing sites by sealing doorways, windows, and other openings. This may require extensive renovations or may be as simple as closing a window or sealing a crack or crevice. All openings over 3/4 inch must be sealed to exclude sparrows (Fitzwater 1994) and all openings over 1 inch must be sealed to exclude starlings (Johnson and Glahn 1994).

Bird proof exclusions can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which require overhead barriers as well as conventional netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Heavy plastic strips hung vertically in open doorways have been successful in some situations in excluding birds (Johnson and Glahn 1994). Plastic strips, however, can prevent filling of the feed troughs at livestock feeding facilities or can be covered up when the feed is poured into the trough by the feed truck. They are not practical for open-air feedlot operations that are not housed in buildings.

**Harassment/Scaring** involves the use of devices such as pyrotechnics, propane cannons, distress calls, lights, eye-spot balloons, mylar tape, and effigies. Harassment is considered ineffective on pigeons (Courtsal 1983) and sparrows (Fitzwater 1994), but persistent harassment could be used to disperse starling roosts (Johnson and Glahn 1994).

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These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford and O'Brien 1990, Rossbach 1975, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988).

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations, are often not practical under large feedlot situations because of the disturbance to livestock, although livestock would habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

**Repellents** could be either tactile or mechanical. Tactile repellents include the various nontoxic, sticky surfaces (e.g. 4 the Birds™, Hotfoot™, Tanglefoot™, Roost No More™, and Bird-Proof™) that encourage pigeons, starlings, and sparrows to find alternate roosting and loafing sites (Fitzwater 1994, Johnston and Glahn 1994, Williams and Corrigan 1994). Mechanical repellents such as porcupine wires (Cat Claw™, Nixalite™) or Bird Barrier™ can be used to exclude pigeons, starlings, and sparrows from landing at loafing or roosting sites (Fitzwater 1994, Johnson and Glahn 1994, Williams and Corrigan 1994). Parallel wires, overhead monofilament grids, and electric shock bird control systems (Avi-Away™, Flyaway™, and Vertebrate Repellent System [VRS™]) can also be used to exclude or repel pigeons (Williams and Corrigan 1994).

### **LETHAL PIGEON, STARLING, AND SPARROW DAMAGE MANAGEMENT METHODS**

These methods involve damage management specifically designed to lethally remove pigeons, starlings, or sparrows in certain situations to a level that stabilizes, reduces, or eliminates damage. The level of population reduction necessary to achieve a reduction of pigeon, starling, or sparrow damage varies according to the resource protected, habitat, species population, the effectiveness of other damage management strategies, and other population factors.

**Shooting** is selective for the target species and may involve the use of either a shotgun or precision air rifle. Shooting is a very individual specific method and is sometimes used to remove a single offending bird. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting at some roost sites would result in a reduction in the local pigeon or sparrow population (Fitzwater 1994, Weber 1979, Williams and Corrigan 1994), but shooting would not effectively reduce starling populations in most situations because of the large densities of birds involved and their behavioral characteristics (Johnson and Glahn 1994). However, shooting would supplement harassment programs for starlings (Johnson and Glahn 1994). Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large number of birds are present.

Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting bird damage management activities and all laws and regulations governing the lawful use of firearms are strictly complied with.

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**Trapping** may include the use of funnel entrance traps, decoy traps, and Australian crow traps baited with a grain attractive to pigeons or starlings (Johnson and Glahn 1994, Williams and Corrigan 1994). Trapping could also include the use of cannon/rocket nets to capture pigeons. Mist nets, funnel traps, and automatic traps (counter-balanced multicatch traps) could be used to capture sparrows (Fitzwater 1994). Pigeons, starlings, and sparrows would be euthanized by methods approved by the AVMA.

Clover, funnel, and common pigeon traps are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. The entrance of the traps also vary greatly from swinging-door, one-way door, funnel entrance, to tip-top sliding doors. Traps are baited with grains or other food material which attract the target birds. WS' standard procedure when conducting pigeon trapping operations is to ensure that an adequate supply of food and water is in the trap to sustain captured birds for several days. Active traps are checked daily, every other day, or as appropriate, to replenish bait and water and to remove captured birds.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps and automatic traps are used by WS for corrective damage management and are effective in capturing local breeding and post breeding starlings and sparrows (DeHaven and Guarino 1969, Knittle and Guarino 1976). Automatic traps are counter-balanced multicatch traps used for sparrows. The sparrow enters a compartment to feed on the bait and is the "elevator" compartment lowers the bird into the trap and then swings back into the original position (Fitzwater 1994).

Mist nets are more commonly used for capturing small-sized birds such as house sparrows. The mist net was introduced in to the United States in the 1950's from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net. Federal permits are needed to trap birds in mist nets (Fitzwater 1994).

Cannon nets are normally used for larger birds such as pigeons and use mortar projectiles to propel a net up and over birds which have been baited to a particular site.

**Nest Destruction** is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction would only be applied when dealing with a single or very few pigeons or sparrows. This method is used to discourage birds from constructing nests in areas which may create nuisances for home and business owners (Fitzwater 1994, Weber 1979, Williams and Corrigan 1994). Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem pigeons and sparrows are highly mobile and can easily return to damage sites from long distances, or because of high populations. The young and/or eggs would be destroyed and the nest removed approximately every 2 weeks throughout the breeding season.

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### **CHEMICAL MANAGEMENT METHODS**

Chemical Management Methods (DRC-1339 and Avitrol) can be used to reduce or disperse local populations of pigeons, starlings, and sparrows. All chemicals used by Virginia WS are registered under FIFRA and administered by the EPA and the VDACS or are approved by the FDA. All WS personnel in Virginia are certified as restricted-use pesticide applicators by the VDACS. No chemicals are used on public or private lands without authorization from the land management agency or property owner/manager.

Pre-baiting would be conducted in compliance with appropriate EPA labeling instructions at strategic locations utilized by pigeons, starlings, and sparrows for feeding, loafing, staging, or roosting. Observations of bird activity at these locations would be made prior to treatment with a toxicant to ensure that non-target species would not be affected. DRC-1339 and/or Avitrol would be applied according to EPA label guidelines and restrictions. Treatment sites would be monitored to determine the effectiveness of the treatment and to prevent take of non-target birds.

**Avitrol (4-Aminopyridine).** Avitrol is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely non-lethal in that a small portion of the birds could be killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. Avitrol treated bait is placed in an area where the targeted birds are feeding and usually a few birds will consume a treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby, frightening the remaining flock away. Avitrol is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring. Any granivorous bird associated with the target species could be affected by Avitrol.

Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to reduce its bioavailability in aqueous media, is non-accumulative in tissues and rapidly metabolized by many species (Schafer 1991). Avitrol is acutely toxic to avian and mammalian species, however, blackbirds are more sensitive to the chemical and there is little evidence of chronic toxicity. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only magpies and crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that magpies exposed to two to 3.2 times the published Lethal Dose (LD<sub>50</sub>) in contaminated prey for 20 days were not adversely affected and three American kestrels were fed contaminated blackbirds for seven to 45 days were not adversely affected. Therefore, no probable risk is expected, based on low concentrations and low hazards quotient value for non-target indicator species tested on this compound. No probable risk is expected for pets and the public, based on low concentrations and low hazards quotient value for non-target indicator species tested on this compound.

**DRC-1339 (Starlicide®).** DRC-1339 is the principal chemical method that would be used for starling and pigeon damage management in the proposed action. For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving starling problems at feedlots (Glahn 1982 and Glahn et al. 1987)

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and Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban pigeon population reduction. Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice.

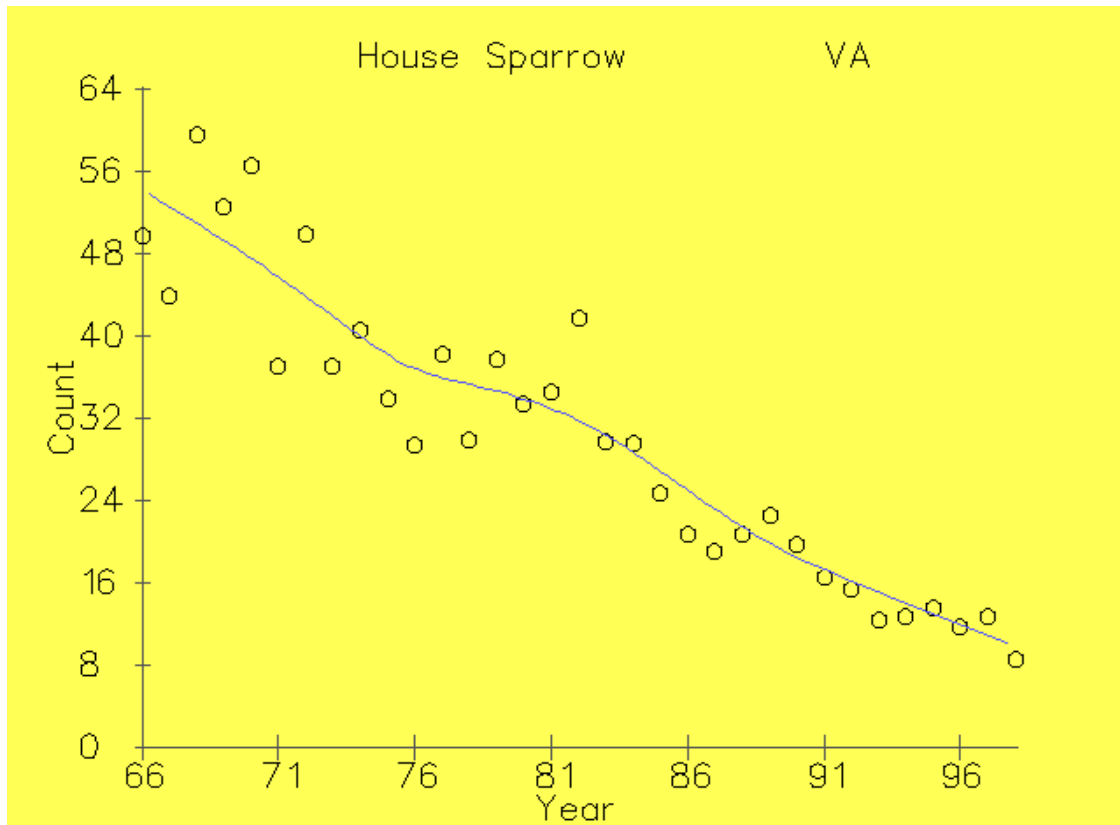
DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to non-sensitive birds, predatory birds, and mammals. For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors, sparrows, and eagles are classified as non-sensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T&E species (USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost non-existent. DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment concluded that no adverse effects are expected from use of DRC-1339.

### **APPENDIX C: BREEDING BIRD SURVEY DATA - TREND ESTIMATES FOR HOUSE SPARROWS, STARLINGS, AND PIGEONS**

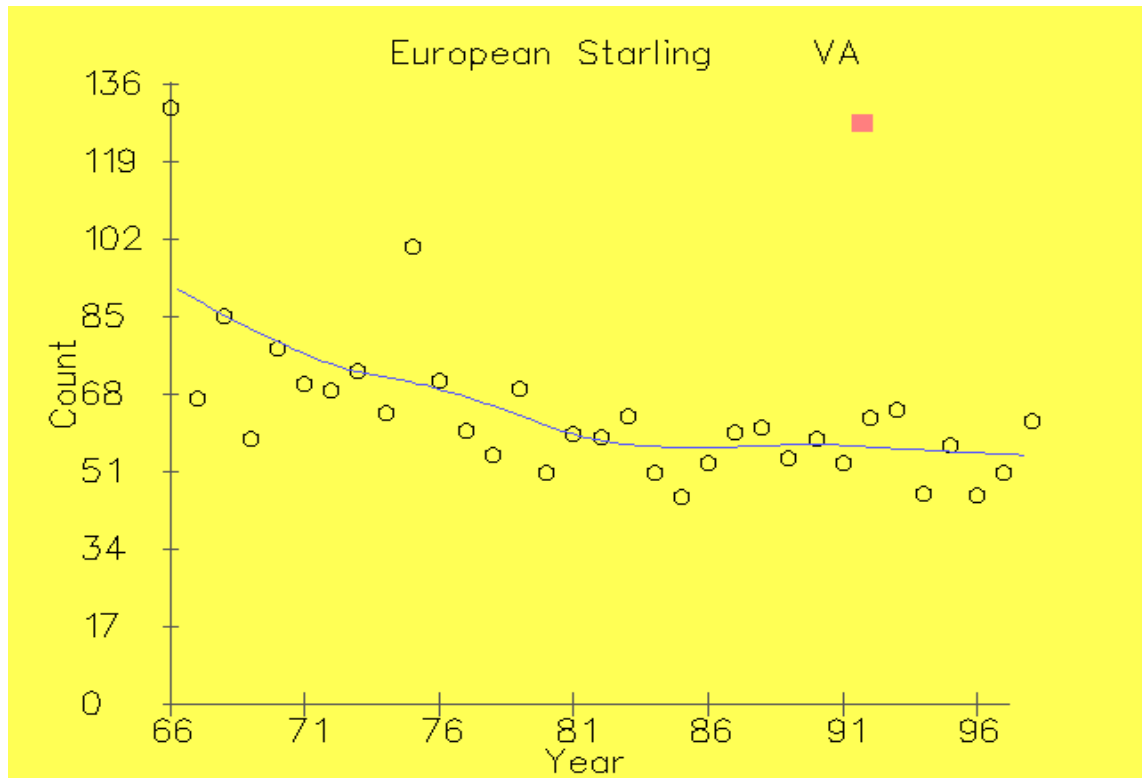
### *Pre-Decisional EA*

BBS population trends from 1966-98 show that house sparrows are decreasing in Virginia by 4.7% per year (Sauer et al. 1997). This trend is also reflected throughout the Eastern Breeding Bird Survey region in that house sparrow populations are declining.



### ***Pre-Decisional EA***

BBS population trends from 1966-98 show that European starlings are decreasing in Virginia by 1.0% per year (Sauer et al. 1997). This trend is also reflected throughout the Eastern Breeding Bird Survey region in that European starling populations are declining.



### *Pre-Decisional EA*

BBS population trends from 1966-98 show that pigeons (rock doves) are increasing in Virginia by 0.8% per year (Sauer et al. 1997). This trend is also reflected throughout the Eastern Breeding Bird Survey region in that pigeon populations are increasing.

